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# PRODUCT PARADE FOR 1957

Page 19

# Contractors and Engineers

magazine of modern construction

JANUARY 1957

Mackinac Straits Bridge
Page 68

AMERICAN ROAD BUILDERS ASSN. 1902

## ROAD SHOW INDEX

Page 204

Laying hot-mix Texaco Asphaltic Concrete wearing surface on sand-shell base and sand-loam base on 19 miles of Texas State Route 73.

CONTRACTORS

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**Gulf Bitulithic Company, Houston, asphalt contractor.**

# The highway problem here was a low-bearing-value subgrade

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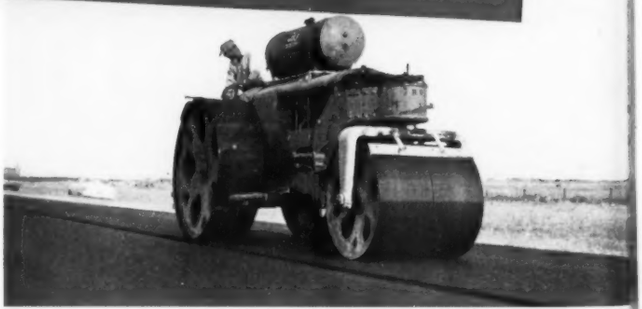

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# Contractors and Engineers

magazine of modern construction

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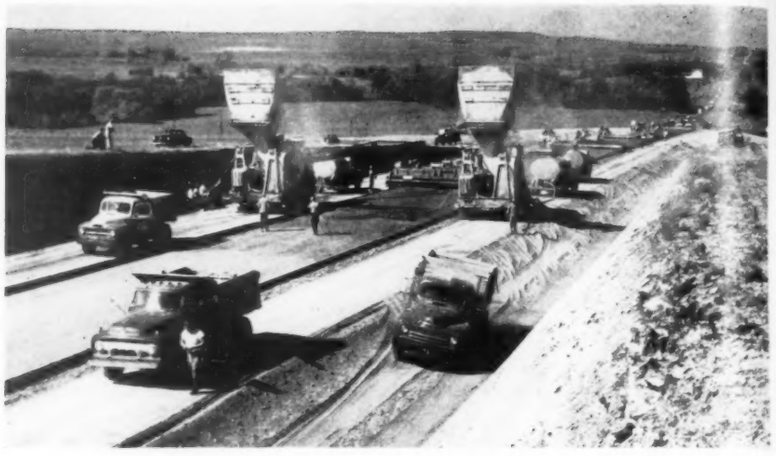
## editorial

# Superhighways—super road show



The picture, right, shows dual paving trains of the Koss Construction Co. of Des Moines, Iowa, placing the first concrete on the first section of the 41,000-mile Interstate Highway System to be constructed under the Federal Highway Act of 1956. The time was last September 26th, and the place was U. S. 40 west of Topeka, Kansas, not far from the geographical center of the country.

A contract for the work, signed on September 6th, is part of the $25-billion federal interstate program whereby the U. S. government pays 90 per cent of construction costs, and the individual states pay the remaining 10 per cent. This particular "first" heralded the beginning of a dramatic highway program which, extending over the next 13 years and costing about $32.5 billion of federal and state funds, will be the greatest public construction program in history.

In step with the program, the American Road Builders' Association is presenting this month (January 28 to February 2) in Chicago's International Amphitheatre its first road show in nine years. This great exhibit is tied in with ARBA's 55th annual convention. Some 25,000 persons, directly connected to the industry, are expected to attend. They will come from this country, and from about 50 foreign countries, to appraise and compare the latest advancements in the machines and materials employed in highway construction.

Starting on page 204 of this issue, we are printing a Road Show Index that lists nearly 300 manufacturers of construction machinery and materials which are exhibiting their newest products in Chicago. The company name and booth number are given, and the firms are grouped for easy reference into the following categories: earthmoving; paving; general utility; components; attachments; maintenance; materials and supplies.

Following the Road Show Index is another listing for Condex (CONference, Display & EXhibit), sponsored by the Associated Equipment Distributors in conjunction with its 38th annual meeting, January 27 to 30, also in Chicago at the Conrad Hilton hotel. The busy show-goer can probably save himself time and shoe leather by consulting these lists and planning his exhibit coverage accordingly. Tear out the pages and take them with you to Chicago.

For a preview of the latest developments in machinery and materials available for the 1957 construction season, turn to our Product Parade section starting on page 19. Some of these items are being shown for the first time at the Road Show. Others are key industry products that have either been introduced or improved within recent months.

The *Road Show Daily*, which CONTRACTORS AND ENGINEERS will publish in Chicago, January 27 to February 1, will carry detailed descriptions of what is being exhibited at individual booths, along with coverage of the respective conventions and shows. (See page 5 for details.) This January issue is the largest ever published by CONTRACTORS AND ENGINEERS. It is noteworthy that it coincides with the most significant, if not the largest, showing of construction machinery ever brought together in one place.

While we are using superlatives, we cannot forget to mention four feature articles in this issue—starting on page 68—on the Mackinac Straits bridge, a key section of the Interstate Highway System in Michigan. Although its main span of 3,800 feet is 400 feet less than the world's longest on San Francisco's Golden Gate bridge, the structure at Mackinac holds the record—8,614 feet—for the longest suspension portion. One of these articles covers probably the most fascinating phase of suspension bridge construction—the spinning of the huge cables.

This magnificent bridge, when completed late this year, will add another link to this country's great system of roads, bridges, and tunnels for motor transportation. Superhighways, super bridges, super construction programs! The man-in-transit era is just really getting under way.

Wheels spinning cables for the suspension section of the Mackinac Straits Bridge travel at a speed of 700 fpm; they are about to meet near the center of the main span. The bridge, 3.4 miles long plus approaches, will become part of the Interstate Highway System when it is completed late this year. *Page 68*

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# C & E's Road Show Daily

In the 36 years it has been reporting the construction scene in this country, CONTRACTORS AND ENGINEERS has developed an editorial policy outstanding for these two aspects: nation-wide coverage of construction projects, and full description of the important new machinery and materials produced for this great industry.

It is only fitting, then, that this magazine begin 1957 and the greatest construction era the country has ever seen by giving special editorial coverage to the industry's most important event in a decade: the ARBA Road Show. Scheduled for January 28 through February 2 in Chicago's International Amphitheatre, this mammoth exhibition of roadbuilding machinery and materials is expected to draw upwards of 25,000 contractors, engineers, highway officials, and other vitally interested persons.

CONTRACTORS AND ENGINEERS' coverage of this important event and the annual meetings being held concurrently will indeed be special: as announced late last summer we shall publish six editions of a daily newspaper devoted to full reporting of the Road Show and the ARBA, AED, IRF, and National Bituminous Concrete Association convention sessions.

The *Road Show Daily* will be published Sunday through Friday, January 27 through February 1, and will be distributed free to rooms in the major Loop Hotels, registration desks at the various convention headquarters, and through a number of outlets such as the CONTRACTORS AND ENGINEERS booth at the Road Show.

Each issue of the *Road Show Daily* will consist of news items and pictures of equipment and materials being shown in the various booths, complete coverage of the various convention programs, and a host of special features. Daily picture pages will record the gathering of the industry's key personalities for this important roadbuilding week.

Special emphasis in the first issue, Sunday, will be given to the Associated Equipment Distributors' convention and to the Condex exhibit planned for Sunday through Wednesday at the Conrad Hilton Hotel.

It is expected that the *Road Show Daily* will provide a handy summary and forecast of what is going on during the busiest week for the roadbuilding industry. Convention schedules, announcements of special events, and other timely news items will help the reader decide where his time might most profitably be spent.

The *Road Show Daily* will maintain Road Show headquarters in the Amphitheatre, but staff reporters and photographers will be on hand daily at the convention hotels and wherever else important events are taking place. A special news gathering center will be maintained at the CONTRACTORS AND ENGINEERS Road Show exhibit, Booth No. 501, just inside the badge entrance in the arena area. The telephone number at the booth will be LAfayette 3-4914.

THE END

SECOND ONLY TO THE PANAMA CANAL in earth-moving magnitude, this 8½-million-yard cut will result in a canyon 1,370 feet wide and 350 feet deep at San Francisco's Carquinez crossing. Although much rock is being encountered, blasting is kept to a minimum and rippers and scrapers help keep the pace close to 30,000 yards per two-shift day! Goodyear 3-T Nylon Cord HARD ROCK LUG tires are taking this tough job in stride.

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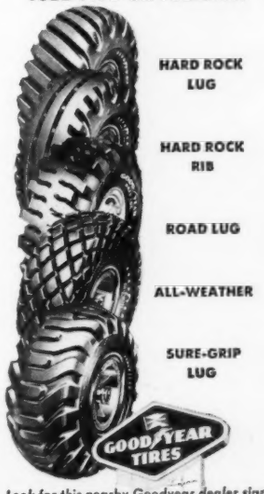


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*AASHO convention urged to control access on new road system; highway officials push program activating Federal Highway Act*

# "Limited Access" looms large in Interstate Highway plans

Meeting for the first time since the Federal Highway Act went into effect last June 29th, the American Association of State Highway Officials was confronted at its 42nd annual convention with the problems of putting into action the largest peacetime public works program in history.

The AASHO met in Atlantic City, N. J., November 27 to 30, 1956. Several hundred highway officials and engineers, representing every state in the Union along with Hawaii and Puerto Rico, were told of the urgency in keeping the road-building plan moving, and of the pitfalls that lie ahead. One of the main problems foreseen by key speakers at the meeting is overcoming opposition to the adoption of a limited-access policy in the construction of the 41,000-mile Interstate Highway System.

This point was raised at the opening session by Rex M. Whitton, AASHO president and chief engineer of the Missouri State Highway Department, in the annual presidential message. "There has been much misunderstanding about access control," Whitton stated. "Let's not overlook that this is one of the greatest engineering factors in highway safety today. It is a guarantee that the highway will live, not become obsolete in sections because of fringe developments. There is a challenge here for us to prove to the public the importance, the value, the life-saving features of access control. Let us not compromise any feature of access control."

U. S. Sen. Edward Martin (Rep.—Pa.), a member of the Senate Public Works Committee, also stressed to the highway officials the importance of an educational or public relations job in regard to limited or controlled access on the Interstate System. "In my opinion," said the Senator, "this is most important because experience with existing limited-access highways has demonstrated that accident rates are reduced about two-thirds as compared with roads having unlimited access. Limited access makes possible the free flow of heavy traffic without congestion, and provides a safe and efficient method for vehicles entering or leaving the highway."

John A. Volpe, interim Federal Highway Administrator, stated that the new concept of controlled access is being challenged by some as an unwelcome restriction, and as threatening a curtailment of their business opportunities. He pointed out, however, that freeways are like a railroad right-of-way to which abutting owners have traditionally been denied the right of access except at stations. Random access, according to the Administrator, "spells rapid, costly obsolescence, paralyzing congestion, and a mounting toll of traffic accidents and fatalities." He cited also economic benefits that follow the construction of modern highways and expressways, mentioning as examples the New York State Thruway, new Route 128 serving Boston's metropolitan area, Houston's Gulf Freeway, and projects in several large California cities and many smaller communities.


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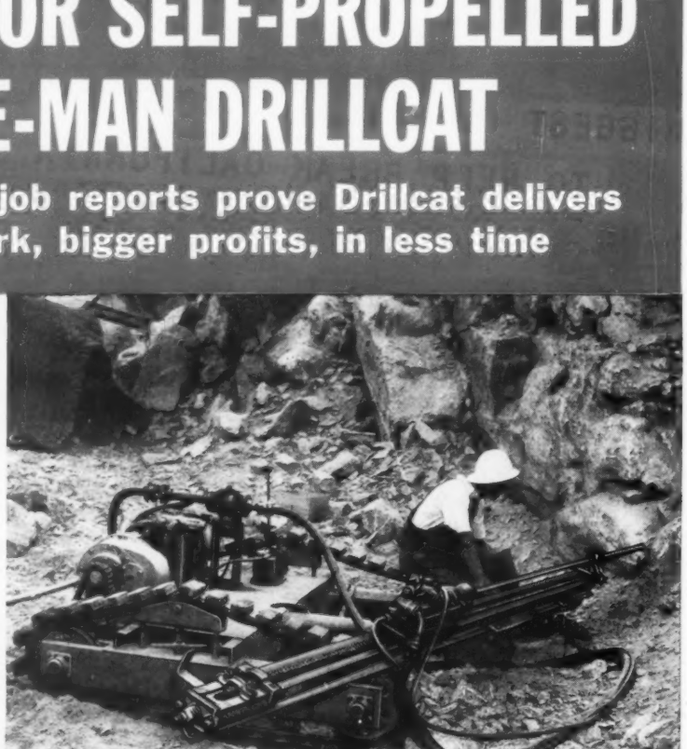

DRILLING TOE HOLES. The Thor Drillcat is completely flexible. The boom and mast are lowered flat to the ground for toe and lifter holes. Twin reversible drive air motors permit easy maneuvering to any position, any angle. (Note position of controls for easy operation.) A "dead man" control for all air valves is standard equipment on the Drillcat.

DRILLING DOWN HOLES. Two 7½ h.p. air motors propel this compact (6 ft. 9 in. overall) Thor Drillcat where no other crawler can go. More than enough power to pull its own air supply. Drilling down holes is no chore for Thor's Drillcat. Using the powerful model 105M drifter and chain feed mast, the hydraulic accumulator keeps boom rigid at all times. This means less steel breakage and less wear on chuck parts.

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Chicago, January 28 through February 2

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Talking over a point in the new highway act are, left to right, A. C. Clark, deputy commissioner of the U. S. Bureau of Public Roads; John A. Volpe, interim Federal Highway Administrator; and John N. Robertson, director of highways for the District of Columbia and president of the American Road Builders' Association.

"They give us a glowing, dynamic picture of business, industrial and social progress in this great country of ours," Volpe maintained. "The Interstate Program will spread this pattern across a continent."

**Not unanimous**

Not all the convention speakers shared this point of view. Sen. Dennis Chavez (Dem.—N. Mex.), chairman of the Senate Public Works Committee, declared that the by-passing of a little community creates an economic problem in that community, and urged that direct access be made available to these four-lane super highways. "You have to consider the man in business," Senator Chavez admonished, "so that he will not be put out of business with a road by-passing his property." He reminded the delegates that his state, New Mexico, and other states in the Southwest have tremendous areas with a sparse population, and with problems different from more congested states. He urged the various highway officials to hold hearings on such questions as access control, so that the people living in small communities may voice their opinion.

The next speaker, Representative Gordon H. Scherer (Rep.—Ohio) challenged that approach, and warned the AASHO of the many pressures that will be brought to bear. "The very heart of the Interstate System is controlled access," said Scherer, a member of the House subcommittee on roads. "Unless these points of access or interchange are scientifically placed, the new system will soon slide back into the same confused, costly, and dangerous traffic pattern which plagues our present highways. All of us know this.

"But the highway directors of this country will be continually harassed by the oil station owner, the grocery keeper, the village council, the local real-estate developer, and even the congressman, to add points of access here and there, and particularly one at Joe Smith's hamburger stand.

"Now while the pressure from average, decent citizens and companies will be great, they will be nothing as compared with the threats, the intimidations, and temptations which the chiselers, crooks, racketeers, and unscrupulous politicians will bring to bear in the next ten years. Not only you, but your subordinates all down the line—sometime in the next decade—are going to come face to face with these elements in our society."

Outgoing president Whitton reminded the highway officials of their obligation, under the 1956 Highway Act, to provide Congress with a detailed estimate of how much it will cost to complete the Interstate System. That estimate must be in the hands of Congress early in January

*(Continued on next page)*


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1958, and will be the basis on which appropriations of funds are made for 1960, 1961 and 1962. Subsequently, at stated intervals, other such estimates must be compiled.

Whitton also urged the delegates to employ initiative and vision to develop advanced methods of doing their work that would be equal to advancement in other fields. One area in need of such improvement, according to Whitton, is the making of field surveys and the preparation of plans. He pointed out that many states have already achieved excellent results with highway location and plan preparation using photogrammetry, and the calculation of earthwork quantities and other operations by using high-speed computers.

### Highway network

Sen. Martin surveyed the highway program in this country, which now has almost 3½ million miles of roads. "The Interstate System," he stated, "now totals 41,000 miles, of which 39,990 miles have been designated. The primary system consists of 234,907 miles, including the interstate. The secondary system consists of 520,371 miles. All three are supported by both the state and federal government. The total mileage in which the federal and state governments are interested is 779,553 miles. In addition to this there are 2,638,661 miles under state and local authorities."

According to estimates, the Senator told the group, the highway program will create at least 300,000 new jobs on direct highway construction alone, and twice as many in related industries, and that the production of road-building machinery and equipment will have to be greatly expanded. "Each billion dollars worth of new highway," Sen. Martin explained, "means an additional 16 million barrels of cement, 76 million tons of sand and gravel, 510,000 tons of steel, 100,000 tons of asphalt, and a $500 million outlay in new construction equipment. In a single year, the federal highway program will require over 5 million tons of steel and 112 million barrels of cement."

Highway Administrator Volpe also stressed the magnitude of the program. "The total volume of all highway construction is now expected to rise from about $5 billion in 1956 to $5.6 billion in 1957," he declared. "This gives assurance, together with funds already approved for the years ahead, of a steady market for material and equipment manufacturers, labor, engineering firms, and contractors. So we urge more engineering and contract lettings." The Department of Commerce official called attention to two dangers that stem from the magnitude and urgency of the new program. "First," he warned, "is the possibility that here and there, under pressure to get the problem rolling, we will launch some projects before they have been fully and adequately planned. The second danger which I foresee lies in the fact that federal funds will make up about 90 per cent of the cost of the Interstate System. Here the temptation may be to overbuild, to provide more costly structures than are required, to multiply points of access, or construct service roads that are not really essential—to mention only a few examples. I am not suggesting that this tendency will be universal, or even widespread, but the risk is obvious."

### Tallamy urges haste

Bertram D. Tallamy, Federal Highway Administrator-designate succeeding John A. Volpe in January, reminded the road officials that time is of the essence, and that red tape will have to be cut to keep the highway construction program on schedule. He also inferred that this schedule was now running behind time, since highway departments have been living off a backlog of plans accumulated in the last two years while waiting favorable action by the Congress. If the state highway officials cannot obtain the necessary personnel to man their departments, he suggested that title companies be given contracts to supply the legal talent for acquiring needed right-of-way. Similar contracts might be negotiated, according to Tallamy, with soil-testing engineering firms to expedite foundation designs for structures, one of the bottlenecks in getting projects under way.

The former chairman of the New York State Thruway Authority linked the Interstate System with the defense highway network, and stated that such super-highways are now used for troop movements when reporting to training camps. The route may be longer in miles, he admitted, but time is saved and accidents are avoided. Another point he brought out in favor of the multi-lane, limited-access roads is their making economically sound the decentralization of industry.

### Guard against fraud

Rep. Scherer, in his address to the general session of the convention, warned the delegates of the danger of fraud despite the strict laws involving the acquisition of right-of-way and the letting of contracts based on competitive bidding. He cited a case in Pennsylvania where five persons were indicted a few months ago on charges of conspiracy to defraud the Pennsylvania Turnpike Commission in a contract. The former com-


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mission had entered into a contract with a company, the owners of which company were close relatives of the then chairman of the commission.

The Congressman also mentioned a case of right-of-way fraud that occurred last March in Maryland when a right-of-way engineer for the Maryland State Roads Commission and two Washington real estate men were indicted for conspiracy to defraud the Commission through land manipulations. The engineer was granted immunity when he testified against the other two, who were convicted by a jury. The engineer had unlawfully leaked information to the real estate men as to properties which had to be acquired in connection with the relocation of Route 240.

"Such land was then purchased," Representative Scherer explained, "often in the name of a straw man, quickly subdivided on paper only, and lots sold to other straw men in order to boost the price when negotiations began with the roads commission. In other instances parcels were purchased and split by conveying part of the tract to a fictitious person. The tract was split so that one parcel would be deadlocked or without access to a highway. Consequently the state had to pay the owner of this part the full amount."

#### New developments in design

C. D. Curtiss, Commissioner of Public Roads, spoke of the progress that has already been made in overcoming the problem inherent in the shortage of engineers. He mentioned that the use of photogrammetry and electronic computers in highway location and design is increasing, and that the best practices of each state are being made known to other states through a series of regional meetings. According to the Bureau of Public Roads head, several BPR engineers have been actively engaged for the past two years in working with manufacturers of electronic equipment and state highway departments in adapting these machines to highway engineering procedures. As an example of such progress, Commissioner Curtiss cited the Wisconsin Highway Department, which had reduced the number of engineers per million dollars of construction work from ten to four in three years. This was accomplished through a comprehensive realignment of duties and use of photogrammetry and electronics.

This subject was pursued in more detail during one of the many technical sessions by Robert E. Pyne, assistant chief engineer of the Massachusetts Department of Public Works. The latter department, according to Pyne, has been using photogrammetry for about eight years, and he mentioned one contract that was awarded to map the proposed location of about 22 miles on an interstate route at a scale of 40 feet per inch with 2-foot contours. The location had been previously determined by the use of the 200 scale photogrammetrics. "We have found these maps to be well within the required accuracy," said Pyne, "and have checked the quantities as scaled from the maps against actual cross-sections taken in the field over a portion of the job, and found them to be within a 2 per cent error."

The Massachusetts engineer also discussed the application of electronic digital computers to highway engineering problems. "Since borrow pit computation has long been one of the more drab tasks of the highway engineer," Pyne said, "it was decided to approach this problem first. A program, or a detailed set of mathematical operating instructions to the computer was developed to calculate the cubic yardage of borrow pits. It is a far faster method than any of the older ones as it eliminates much of the time required for transcribing notes and plotting cross-sections and reduces actual computation time to a very few minutes."

In the question-and-answer period following the presentation of his paper, Pyne stated that contractors at present are reluctant to receive payment for earthwork items from estimates based on photogrammetry work. He was optimistic, however, that these new methods will in time be accepted as sufficiently accurate for final payments as they are now for preliminary estimating.

Contractor relations with highway departments were also discussed by Howard R. Craig, Engineer of Construction with the Ohio Department of Highways. He related the experience of Ohio in requiring contractors to stake out their own work. At first this was handled as a pay item, but when this method was considered unsatisfactory, payment was made on a lump-sum bid. "Either our design consultant or our own force give the contractor all control points and necessary bench marks," Craig explained. "It then becomes the contractor's responsibility to furnish such things as slope stakes and grade stakes. We also require him to set sufficient stakes to define the right-of-way.

"We found many bugs when we first started this procedure, but time and experience have eliminated these. We find that most of our larger contractors have organized their own engineering forces, which has worked very well, as we only use this method on large projects that lend themselves to this method. The contrac-


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tors are opposed when the demand is not sufficient to maintain their crews. The contractor is not limited to salary schedules; therefore he is competitive to private industry, which the state is not. We have lost some personnel but not to the extent that would normally be expected. The old cry of the contractor to keep grade stakes out ahead has become eliminated, and the contractor generally likes this as it gives him better control of his operation."

### New AASHO head

For its next president, the American Association of State Highway Officials elected William A. Bugge of Olympia, Washington. He is the Director of Highways for the Washington State Highway Commission.

The new AASHO president, William A. Bugge, is Director of Highways for the Washington State Highway Commission.

The Bartlett Award for outstanding service in the field of highways during the year 1956 went to Pyke Johnson who headed the consulting staff of the Clay Committee. The latter committee was appointed by President Eisenhower, and its report detailed U. S. highway needs which became the foundation for the Federal Aid Highway Act of 1956. Johnson is a former Denver, Colorado, newspaperman, and was also editor of the Colorado State Highway Department's official publication. In 1942 he became president of the Automotive Safety Foundation, and served that organization until his retirement 11 years later.

The award, in the form of a plaque, is a joint honor made by the AASHO, the Highway Research Board, and the American Road Builders' Association. The presentation was made by G. Donald Kennedy, president of the Portland Cement Association.

THE END

## Twin Disc appoints two

The Twin Disc Clutch Co., Racine, Wis., has appointed R. A. Harmon manager of district sales, and Paul J. Demet to succeed Harmon as dealer sales supervisor. Mr. Harmon has served as the firm's field representative, as Eastern district sales engineer and manager of dealer sales.

Mr. Demet will be responsible for promoting product sales through authorized dealers and establishing dealers in the United States, its possessions, Canada, and Mexico.

## Asphalt paving boxes leave no wheel marks

■ A group of truck-towed paving boxes that are said to work very fast because they leave no wheel or shoe marks to be raked out afterwards is available from the Creative Metals Corp. The Cmetco Rola pavers have full floating screeds. Added compaction is attained by the load bearing on the screeds.

Included in the line is a high-speed trench paver adjustable in any increment down to one foot. The other paving boxes are in 8 and 9-foot spread widths with side gates for controlling the volume of material. Insert plates allow for intermediate widths.

With no wheels or shoes to leave marks that must be raked out afterwards, the truck-towed Cmetco Rola paver helps speed operations.

The towed paving boxes are recommended for spreading crusher-run rock, as well as asphaltic mixes. Pav-

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You can depend on BLAW-KNOX PAVING EQUIPMENT EXPERIENCE for the BIG JOBS AHEAD

**BLAW-KNOX PAVING EQUIPMENT**
**proved on Turnpikes and Superhighways across the Country**

On Turnpikes and on Superhighways all across the country Blaw-Knox Concrete and Bituminous Paving equipment units have proved they have what it takes to produce big capacities to rigid specifications under tight working schedules. Among the major highway projects where Blaw-Knox equipment has been proved are: Pennsylvania Turnpike, New Jersey Turnpike, New York Thruway, Virginia Turnpike, Ohio Turnpike, Indiana Turnpike, Massachusetts Turnpike, Kansas Turnpike and the Florida Turnpike. This same equipment has proved equally successful on smaller paving projects.

In the Blaw-Knox "Complete Package" you get the most efficient concrete paving outfit available, because every piece of equipment is built by one responsible, experienced manufacturer, with each unit engineered to match the others in size, capacity and performance. Road Forms carry the Precision Subgrader, Transverse Blade Spreader and Finisher. Automatic Batching plants will keep two of the new hydraulic MultiFoote Pavers working at peak capacity.

On Bituminous Paving projects you can have the same efficient low cost production. This Blaw-Knox equipment assures you the biggest capacities for spreading the sub base material, laying the pavement mat, to finishing the shoulders. Blaw-Knox Base Pavers will spread up to 400 tons per hour of base material *without segregation*. The new Model PF-90, described on the opposite page, can handle up to 200 tons per hour of bituminous paving. The Blaw-Knox Road Widener will assure fast work of shoulder building without wasting material.

When you have a Blaw-Knox paving outfit for either bituminous or concrete paving you get preventive maintenance since all your equipment belongs to one family. It's standard practice for your Blaw-Knox trained service man to check each unit on each service call, to stop trouble before it starts.

You can get the complete story on Blaw-Knox paving equipment from your nearest Blaw-Knox distributor. Many of these high capacity units will be at the 1957 A.R.B.A. Road Show.

**BLAW-KNOX PAVING EQUIPMENT**

Road and Airport Forms Manual or Automatic Cement and Aggregate Bins and Batchers Precision Subgrader MultiFoote Concrete Paver Concrete Spreader (with or without Vibratory Attachment) Concrete Finisher (with or without Vibratory Attachment) Base Pavers Bituminous Paver Finisher Road Widener Trench Roller Street and Gutter Forms Concrete Buckets

ing thickness is adjustable from ½ to 8 inches by the paving operator, who rides on the screed. The operating handles which control the spread thickness can be pitched for non-uniform grade patching.

For further information write to the Creative Metals Corp., 1290 Powell St., Emeryville, Calif., or use the Request Card at page 18. Circle No. 268.

## Announce welding awards

The American Welding Society, of New York, N. Y., has announced the establishment of two awards for outstanding accomplishments in welded design. Established by A. F. Davis, vice president and secretary of the Lincoln Electric Co., they will be known as the A. F. Davis Silver Medal Awards.

One award will be presented to the author, or authors, of the paper selected by the AWS judges as the best contribution to the progress of welding in the field of structural design, while the second will be awarded for the best paper on machine design. To be eligible for the award, the papers must have been written by either one or two authors, and must have been published in The Welding Journal.

Draftsman refers to a print, which has been made from Micro-Master 105mm negative, through table-top viewer. In background, another draftsman holds negative.

## New reproduction system can improve on originals

■ A new photographic reproduction system that is said to give sharp, clear, distortion-free second originals up to 36×54 inches or longer is announced by Micro-Master, Inc. The system reportedly can give improved copies of most worn and smudged drawings without the use of retouching procedures.

Using a 105mm film that is 16 times larger in area than conventional 35mm microfilm, the Micro-Master system was developed in association with the Keuffel & Esser Co., Hoboken, N. J., manufacturers of a variety of papers, cloths, and films used in reproduction.

The negatives measure approximately 4×6 inches. They easily fit standard 5 × 8-inch filing drawers. Contact prints are available to reduce handling of the negatives and to accommodate cross-indexing systems. In most instances, the contact prints themselves show enough detail to the naked eye for normal reference purposes.

In addition to full-size reproductions and contact prints, the photographed drawings can be studied through table-top viewers and large-sized viewing tables. The negatives can also be projected onto screens.

According to the company, the Micro-Master system eliminates dirt and smudges without the use of artwork on the negative. The weakest image is captured without respect to background dirt. Soil and mottle are then clipped out of the print with precisely timed exposures.

In many cases, the second original is superior to the drawing from which the negative was made. This is because the carbon pencil lines on the first drawing are replaced by darker, sharper silver compound lines, and background deficiencies of the original are not picked up on the photographic copy.

For further information on the new reproduction system write to Micro-Master, Inc., 4241 Pennsylvania, Kansas City 11, Mo., or use the Request Card at page 18. Circle No. 272.

## Owatonna Tool Co. news

Bill Murray has been appointed assistant sales manager of the Owatonna Tool Co., Owatonna, Minn. For the past five years Murray has served the company as credit manager and supervisor of customer sales. In his new position he will assist sales manager Robert L. Allyn.

BUILD BETTER ROADS TODAY
FOR A GREATER AMERICA
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957
AMERICAN ROAD BUILDERS ASSOCIATION

**Blaw-Knox 1957 Model PF-90 is even Better!**

The Blaw-Knox Model PF-90 Bituminous Paver Finisher now has engineering advances that provide higher paving speeds and greater paving width. A wider range of paving speeds is provided with a new two-speed axle that gives a low working speed of 10 feet per minute to a high paving speed of 52 feet per minute. The PF-90 also has a higher travel speed of 7.4 miles per hour to give you greater mobility on between paving moves.

Another important feature of the new Model PF-90 Paver is the increased paving width. It can now lay a bituminous mat 16 feet wide, three feet wider than the previous maximum width of 13 feet. This new paving width has been tested and proved on many types of operation including the Massachusetts Turnpike.

Other important features of the Model PF-90 include the rubber tire mounting which eliminates from 600 to 700 wear parts typical of crawler mounted pavers. The PF-90 also has a big 10-ton hopper so it can take a full truck load without spillage. You can see these features and many more at the Road Show.

**Blaw-Knox will show the latest and best at the 1957 Road Show**

The Blaw-Knox exhibit at the A. R. B. A. Road Show, from Jan. 28 through Feb. 2, 1957 will show important equipment that you will want to plan on using in your future paving jobs. Some of the equipment shown will include: New Bituminous Paving Equipment, an Improved HiBoy TRUKMIXER, Improved Automatic Batching Equipment, the Time-tested Concrete Spreader, a Base Paver, Road Widener and a Trench Roller.

*The Blaw-Knox Exhibit is located at Booth 727 in the Exhibition Hall at the International Amphitheatre*

**BLAW-KNOX COMPANY**

CONSTRUCTION EQUIPMENT DIVISION

**40 Charleston Ave., Mattoon, Illinois**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 406

## names in the news

### G. Atkinson, L. Perini to receive Moles awards

The Moles, a society of leading figures in the tunneling and heavy-construction industry, has named Guy F. Atkinson of San Francisco, Calif., and Louis R. Perini of Framingham, Mass., recipients of the 1957 awards. The awards are presented annually to one member of the society and one non-member.

Mr. Perini, the member winner, is president of B. Perini & Sons, a company that has figured in many of the largest tunnel and dam jobs in the East for the past 20 years. He is president of the Milwaukee Braves baseball team; and is past president of the New England Road Builders' Association.

Louis R. Perini, member winner of the 1957 Moles award, and Guy F. Atkinson, the non-member winner.

The 81-year-old Mr. Atkinson is the board chairman of the Guy F. Atkinson Co., which has held contracts for the Grand Coulee Dam, Treasure Island for the San Francisco World's Fair, McNary Dam and Powerhouse, and the Hanford, Wash., atomic energy plants. Atkinson is past president of the National Associated General Contractors.

Formal presentation of the awards will be made at a dinner on February 7 at the Waldorf-Astoria Hotel in New York, N. Y.

### Waterbury opens office as consulting engineer

Lawrence S. Waterbury, who recently retired as a partner of Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y., has opened his own office as a consulting engineer at 26 Broadway, New York, N. Y.

Mr. Waterbury, who has specialized in the preparation of reports on traffic and earnings, mass transportation, export development, arterial highway route location, and public utility valuation, has taken charge of numerous projects within this field, some of which include: the traffic and earnings reports for the Pennsylvania Turnpike, the master plan for the Miami International Airport, a port development study covering the state of Connecticut, and the arterial traffic study made prior to the construction of the Texas Turnpike.

Waterbury, who has been a practicing engineer for nearly 40 years, is a member of the American Society of Civil Engineers; Institute of Traffic Engineers; American Bridge, Tunnel and Turnpike Association; The Highway Research Board; American Public Works Association; and other professional organizations. He will remain with Brinckerhoff, Hall & Macdonald as a consultant.

### New assignments for Corps officers

Col. Roswell P. Rosengren has been named chief of the Technical Liaison Division, Office of the Chief of Engineers, U. S. Army, succeeding Col. Stanley G. Reiff, who has become executive of civil works in the office of the chief of engineers. The former civil works executive, Col. George H. Walker, has been assigned to duty in Korea.

Col. Rosengren, who has been an officer in the U. S. Army Corps of Engineers since 1941, has had considerable previous experience in Army public information activities, having served in this field in the United States and overseas.

The Corps has also announced the appointment of Col. Stanley T. B. Johnson as district engineer in Baltimore, Maryland, beginning in March. He will succeed Col. Stephen E. Smith, who has been assigned to Korean duty. Until Col. Johnson assumes his new post, the assistant district engineer, Lieut. Col. John A. B. Dillard, will serve as acting district engineer.

### AISC elects officers, directors, and committees

N. P. Hayes, president of the Carolina Steel & Iron Co., Greensboro, N. C., has been elected president of the American Institute of Steel Construction, Inc. He has been a member of the association's board of directors since 1947, and has acted as vice president since 1954.

H. Buckley Dietrich was elected first vice president, and James M. Straub, second vice president. For the past two years they have served as second vice president and treasurer, respectively. L. Albert Post, who has acted as executive vice president since 1947, was re-elected to this position, and Erwin P. Stupp was elected treasurer.

The Institute also named three new members to the board of directors, and re-elected nine men to the executive committee.

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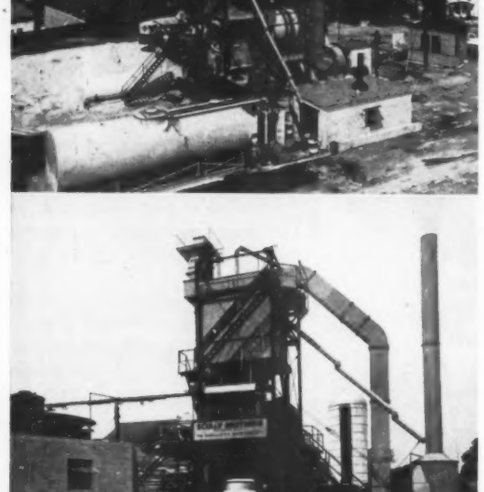
American Hereford Association

there is a LITTLE BULL...

in most all advertisements of construction machinery—particularly Asphalt Plants

*If you will review some trade journals, you will learn that practically every make of every type of construction machinery on the market is the most dependable, the most durable and economical, the fastest producing, and the most accurate.*



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To get the **facts** about all makes of asphalt plants, talk to the men who own them and the men who run them.

Any Simplicity Plant or Simplicity Plant Owner will do a much better job of convincing you that Simplicity is the very best, than all the "bull" our advertising agency can write or our salesmen can shoot.

**But** to justify the expense of this ad we must still "shoot the bull" by saying **Simplicity** is the most **dependable, durable and economical asphalt plant ever built—the finest money can buy.**

THE SIMPLICITY SYSTEM COMPANY
DIV. OF WEST CONSTR. CO.
RIVERSIDE DRIVE
CHATTANOOGA, TENNESSEE

P.S. *Write us for location of the Simplicity Plant nearest you. See it in operation; talk to the men who run it!*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 407

Francis V. duPont.

## F. DuPont now consultant for two engineering firms

Francis V. duPont, former U. S. Commissioner of Public Roads, has become a consultant with two consulting engineering firms—Parsons, Brinckerhoff, Hall & Macdonald, New York, N. Y.; and Lockwood, Kessler & Bartlett, Inc., Syosset, N. Y. He will have his office at 1025 Connecticut Ave., Washington, D. C.

For 23 years prior to his elevation to the nation's top road post, duPont was chairman of the Delaware State Highway Commission. Under his direction Delaware's pioneer system of divided highways was developed. In 1948 he received the "Citation of Distinction" of the American Association of State Highway Officials.

## Asphalt group appoints district engineers

The Asphalt Institute, College Park, Md., has appointed Albert L. Love, Jr. district engineer for New Mexico, with offices in Santa Fe. Love, who recently returned to the United States after three years in Baghdad, where he helped organize an Iraq highway department, previously served as an airfield paving specialist with the U. S. Corps of Engineers, and as a member of the Texas State Highway Department.

A registered civil and geological engineer, Love is a member of the Texas Society of Professional Engineers, the National Society of Professional Engineers, and the Baghdad Engineers Association.

The Institute has also announced the appointment of Charles A. McKeogh as engineer for the New Orleans district, to direct Institute activities in Louisiana and Mississippi. He will succeed William H. Rhodes, who has retired.

Prior to this appointment, McKeough served as a paving specialist with the U. S. Corps of Engineers. He has also been a paving engineer with the Texas Highway Department and a paving superintendent with a Texas construction company.

## Rooney named to committee on Taft-Hartley amendment

Frank J. Rooney of Miami, Fla., president of The Associated General Contractors of America, Inc., has been appointed by U. S. Secretary of Labor James P. Mitchell to represent this organization on the management-labor committee which Mitchell recently formed. The committee will formulate recommendations for amendment of those sections of the Taft-Hartley Act which relate specifically to the construction industry.

## D. B. Steinman to design Iraq suspension bridge

Dr. David B. Steinman, consulting engineer of New York, N. Y., has been retained by the government of Iraq to design and supervise the construction of the Karradah-Baghdad Bridge, a suspension-type bridge that will span the Tigris River in Baghdad. The $5 million bridge, to be located near the Royal Palace, will be on the highway leading to the airport.

## Idaho names Sachse as new district engineer

Alfred J. Sachse has replaced John A. Phelps as district engineer of district No. 5 at Coeur d'Alene, Idaho. Mr. Sachse has held during the past the positions of district maintenance engineer, district bridge engineer and senior resident engineer. He has been associated with the department since 1923.

John A. Phelps was first locating engineer in Boise for Southern Idaho. He later became district engineer at Lewiston, and in 1955, district engineer at Coeur d'Alene.

## Murray D. Shaffer joins Ohio engineering firm

Murray D. Shaffer is now a consulting engineer with Shaffer, Parrott & Associates of Mansfield and Wooster, Ohio, a highway, sanitary, and industrial engineering firm.

In the past 30 years Shaffer has served as director of Public Service and Safety for the city of Mansfield, and has held various positions with the Ohio Department of Highways. Some of these positions include division engineer, chief engineer of the Bureau of Design, and director of highways under the administration of Governor Thomas J. Herbert.

Since 1948 Shaffer has been director of sales for the Buffalo-Springfield Roller Co., Springfield, Ohio.

Murray D. Shaffer, a consulting engineer with the firm of Shaffer, Parrot & Associates.


extraordinary!

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*Now...the completely new*

Forward Control 'Jeep' FC-150

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Meet the world's newest, most exciting 4-wheel-drive Truck. New Forward Control design is the secret!

*It's the first time a 4-wheel drive truck has so effectively combined outstanding maneuverability with so much cargo capacity!* This newest truck concept puts a 74" pickup box on an 81" wheelbase to give you record-breaking cargo space per inch of wheelbase.

The new 'Jeep' FC-150 gives you safety-tested big-truck features with traditional 'Jeep' stamina and versatility. This newest addition to the famous 'Jeep' family, retains all the rugged, versatile, functional features you'd expect to find in any 'Jeep' vehicle.

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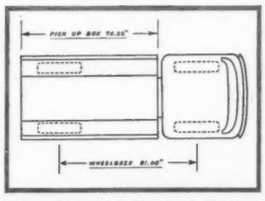

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**New Safety-View Cab** is extra roomy, has largest wrap-around windshield in the FC-150 weight class.

'Jeep' Forward Control 4-Wheel-Drive FC-150

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WILLYS MOTORS, INC.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 408

**Management**

# Tax laws can help contractors select the best payment method

***Deductions and depreciation can be figured in different ways; contractors have to choose the method most advantageous to them***

Within the next two or three months, the big and little contracting firms throughout the nation—like any other big or little businesses—will start the annual job of figuring out their income tax.

The firms that will find themselves well off at this time of year are those that have been tax-minded all year round. The difference between firms that are tax conscious and those that are not can very often be measured in dollars and cents.

Suppose, for instance, that two firms—one taking full advantage of all allowed by the tax law and the other, through ignorance or carelessness, doing just the opposite—were forced to replace their air conditioners last year. Suppose also that the price of the equipment in both cases was originally $2,500. At the time the air conditioner was replaced, both firms had taken $1,000 on it in depreciation. This means that its cost for tax purposes was $1,500. Both firms found that they could either sell the old unit to a private party for $500 or trade it into a dealer for a $500 allowance. In both cases, the firms stood to lose $1,000 whether they accepted the dealer's trade-in allowance of $500 or sold the air conditioner to a private party for $500.

To one firm, this sounded like six of one and half-a-dozen of another, so without thinking or worrying about tax matters, it traded in the old air conditioner. The tax-minded firm, however, sold its air conditioner to the private party. Both these firms were in completely different positions when it came time to file their tax returns.

The company that traded in its old air conditioner found that it could not claim a deduction on its return for its $1,000 loss. The most it could do was to add the amount of the loss to the cost of the new unit and eventually receive tax credit for the loss in the form of slightly higher depreciation deductions.

The company that had sold its old unit to a private party and purchased a new air conditioner separately had established a loss of $1,000. This was claimed as a loss deduction on its tax return and used to offset regular income.

### Cases differ

While individual cases vary, the general rule to follow when trying to determine whether it would be better to sell or trade in an asset is: Sell "loss" property to obtain a deduction and trade "profit" property to avoid the tax which must be paid on any profit realized from the sale of an asset.

If a firm has not figured its depreciated costs correctly, it may find that it has sold itself into a capital gains tax or traded itself out of a


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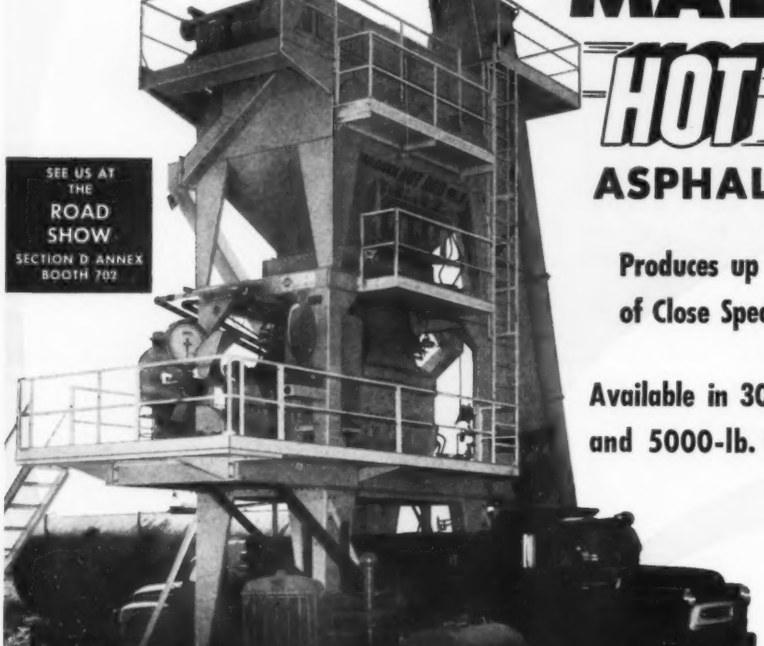

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SECTION D ANNEX
BOOTH 702

Produces up to 250 T.P.H.
of Close Specification Mixes

Available in 3000-lb., 4000-lb.
and 5000-lb. Batch Capacities

Whether you are a contractor who likes to move or the "get-set-and-stay-there" type of operator... the new MADSEN Model 391 HOT ROD Asphalt Plant is designed for you! This plant is extremely versatile... capable of delivering maximum daily tonnage of top grade bituminous mix under today's exacting specifications. The HOT ROD has a minimum of removable parts for transport and sets up quickly. It is streamlined in design, has no "excess baggage", and it is one of the easiest-to-operate asphalt plants in the industry. Some of the outstanding features of this new MADSEN Model 391 HOT ROD Asphalt Plant are shown below... check them—then ask your MADSEN Distributor for complete details and engineering specifications.

- New fully-enclosed (running in oil) gear box reduction unit that goes right to the mixer shafts... eliminates exposed mixer timing gears.
- Famous MADSEN Twin-Shaft Pug Mill Mixer (Patented) with externally removable sectional liners, improved mixing action and faster discharge.
- Simplest, cleanest design in the industry... with a minimum of removable parts for easy transport and fast set-up.
- MADSEN Asphalt Pressure Injection System with new rotating distribution bar (Patented)... injects the asphalt into the mill quickly—cuts it off sharply to give you improved mixing and reduced mixing time.
- Operator station on end of plant... with swivel-head asphalt and aggregate scales and all controls conveniently located for easy fatigue-lessening plant operation.
- Fast air operation of bin gates, asphalt pressure injection system and mixer gate.
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*INCLUDES*
ASPHALT PAVING PLANTS • PUG MILL MIXERS • AGGREGATE DRYERS • DUST COLLECTOR UNITS
ROAD PUG TRAVEL-MIX PLANTS • WEIGH BATCHERS • SUPER FLOAT AND JOHNSON FLOAT FINISHERS
ASPHALT TANKS • ROYAL CROWN PUMP VALVES • ASPHALT AND FUEL PUMP UNITS

BLH BALDWIN-LIMA-HAMILTON
MADSEN WORKS
BALDWIN-LIMA-HAMILTON
CONSTRUCTION EQUIPMENT DIVISION
DIVISIONS: Austin-Western • Eddystone • Electronics & Instrumentation • Hamilton • Lima • Loewy-Hydropress • Madsen • Pelton • Standard Steel Works

For more facts, use Reader-Reply Card opposite page 18 and circle No. 409

loss deduction. Such a matter can be easily cleared up if the problem is discussed with a certified public accountant. He not only can verify the accuracy of a firm's computations, but he can also explain the advantages and disadvantages of the various methods used to compute depreciation. Many firms will find, after consultation, that the method it has been using is not the one most suited to its business needs from a tax standpoint.

#### Declining balance vs straight-line

If a contractor asked a CPA whether it should use the straight-line or declining balance method to depreciate its new air conditioner, one of the first questions the contractor might be asked is: What are your cash requirements and what profits do you expect to make. If a company is thinking of expanding its business and will need cash within the next few years, the CPA might recommend that the firm use the "new" declining balance method to compute depreciation.

This method accelerates or increases depreciation rates, starting a chain reaction that leads to cash being retained in the business. This results because when depreciation rates are increased, the depreciation allowed on the tax return also increases. The amount that may be written off in the first year is twice what it would be under the straight-line method. On one piece of equipment, straight-line depreciation might amount to $500. Depreciation allowed for the same piece of equipment under the declining balance method would amount to $1,000. The firm hoping to expand would select the declining balance method for tax purposes, apply $1,000 instead of $500 depreciation deduction against its regular income, and reduce its taxes for that year. The cash not paid out in federal taxes can be retained for business expansion.

#### Look ahead

Like all good things, the advantage of using the declining balance method comes to an end. While the declining balance depreciation rate may be double that of straight-line in the first year, the gap closes gradually in succeeding years until the declining balance deductions are even less than they are under the straight-line method. This makes it important for contractors to consider current and future earnings before selecting a depreciation method.

The straight-line method would prove better than the declining balance method for a firm with low current earnings. A firm that is expanding might also find it more advantageous to use straight-line depreciation, since the expansion might take a few years to show up as earnings on the account books.

Unlike the declining balance method, which accelerates depreciation deductions on equipment only in the first years of its life, the straight-line method spreads out the deductions in equal amounts over the estimated useful life of the asset. The contractor using the straight-line method is, in a sense, saving for a rainy day.

The firm that has had low current earnings and is now showing a good profit will be able to apply more substantial depreciation deductions against its earnings under the straight-line method than the declining balance method. It is usually better not to use the higher depreciation rate if the money allowance is not needed for a sound reason.

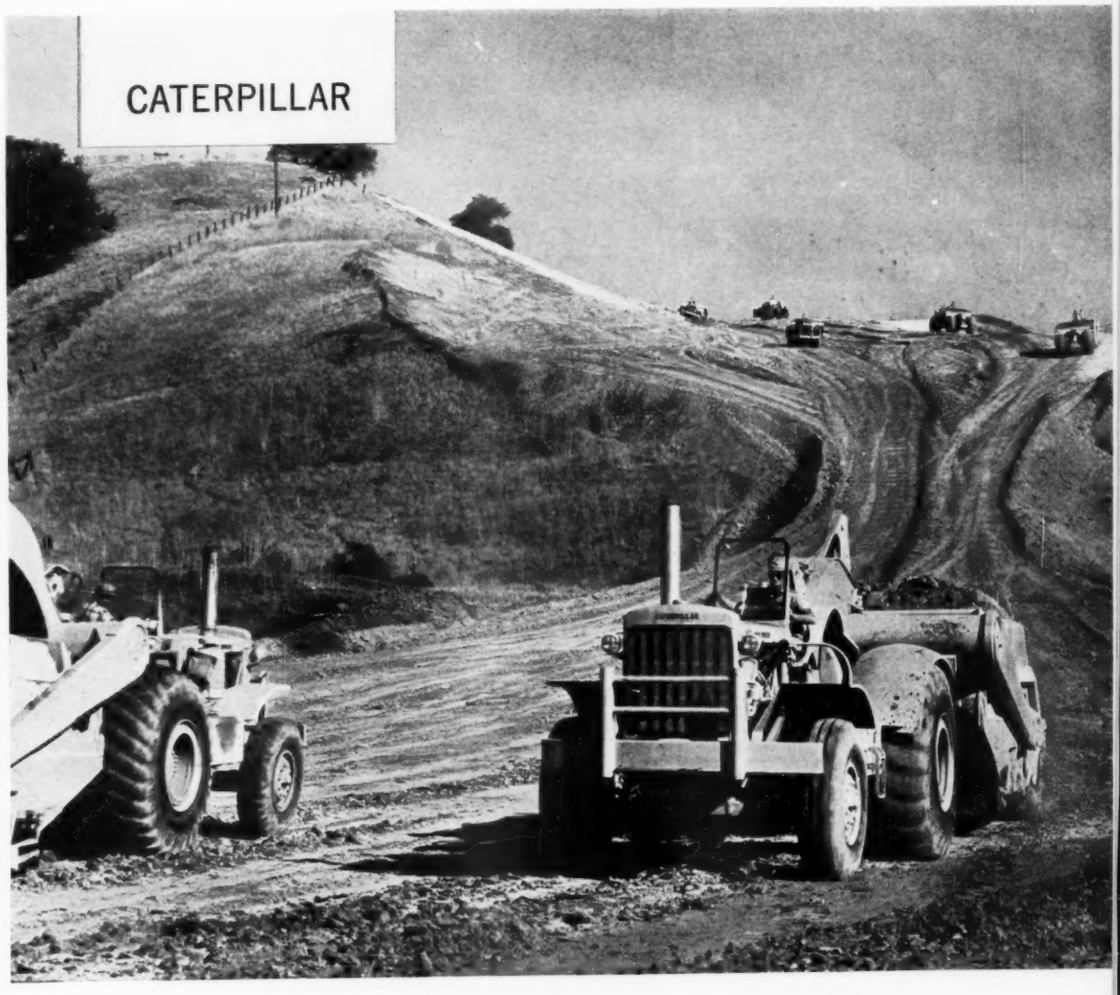
Though contractors can select either method of depreciation to apply to newly purchased equipment, only the straight-line method can be used to depreciate second-hand equipment. In some cases, the immediate savings in buying used equipment will be canceled if the contractor cannot use the declining balance method—with its rapid write-off feature—to depreciate the unit.

#### Organization form

A matter that is often overlooked—but which should be reviewed by tax-minded companies from time to time to find out whether a change should be made—is whether or not the firm is better off as a proprietorship, partnership, or corporation.

Many times, a non-corporate form of organization is forced on a firm, but a new or expanding company can gain definite tax advantages by incorporation.

Proprietorship and partnership income is taxed at individual rates, which range from 20 per cent to 91 per cent. Corporate earnings are taxed at corporate rates of 30 per cent of the first $25,000 earned during the year and 52 per cent on the excess. If a firm's earnings are relatively low, the proprietorship-partnership rates may appear to be lower, until another fact is taken into account: The corporate tax carries with it the privilege of deducting a rea-


# THE ROAD AHEAD

**America's new highway program is a 50-billion-dollar challenge to the nation's road builders. Success of the greatest building project ever conceived by man rests with them alone**

America has handed the new Federal-aid highway building program to the nation's road builders with complete confidence.

In the next 13 years, the U.S.A. will spend 50 billion dollars building Federal-aid roads alone. From the program will rise a magnificent 41,000-mile system of Interstate Freeways. It totals up to the greatest building project in history.

Only this nation could have the vision for such a program. For only America has the need for it . . . and the resources to see it through to completion. And only America—unawed by bigness—could start such a program without a doubt of its success . . . a magnificent tribute to the nation's road builders.

But make no mistake about it. This is a 50-billion-dollar challenge. It will take co-ordination, co-operation, and the combined experience of the nation's contractors, engineers, Federal and State road officials, bankers, material producers and equipment manufacturers. They start with the nation's confidence. Will they be able to hold it on the long road ahead? The next two pages will give you a clue.


CONTINUED

sonable salary for the employee-owner. True, the employee-owner has to pay a personal tax on his salary, but if the company were not incorporated, he would have to pay a personal tax on all the money earned by the business.

If the retained earnings of the company are taxed at a corporate rate, the employee-owner would have additional funds available in the corporation for expansion purposes. These funds may be accumulated in a corporation up to $60,000 without further tax penalties, and the sum can even be higher if the corporation can prove a need for them.

These advantages—while they may cut a tax and increase working capital for expansion needs—can be lost by a firm that has to withdraw money from corporate earnings to pay personal expenses. Such a company, if it is incorporated, will have to withdraw the funds in the form of dividends. This means that the corporation will have to pay tax on the earnings that are being withdrawn as dividends, and the persons receiving the dividends will have to pay a tax on the dividends. Since this "double tax" on earnings and dividends can nullify any tax advantage gained by incorporating a firm, contractors who have to withdraw money from earnings to purchase needed materials and supplies should carefully review their long-range cash requirements before deciding on incorporation.

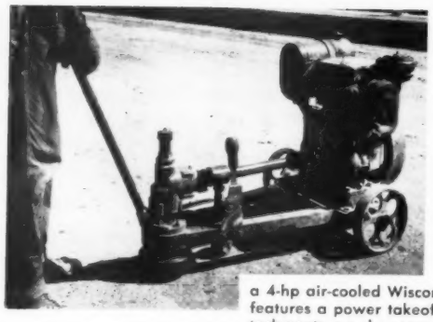
Contractors too often limit their tax thinking to one period of the year, and then they are in no position to make a sound decision on the way they should pay their taxes. The time to think about paying too much in taxes is always "now", for business decisions made in the fall can effect the amount of the tax that has to be paid in the spring. Paying taxes is not usually a pleasant job, but it can be made more so if contractors select the method of payment that will work to their benefit. If firms are in doubt about the tax effect of even the most routine business decision, a certified public accountant will be able to provide some help. The job of paying taxes can be easier, if companies make year-round tax thinking a habit. THE END

*This article is based on information supplied by the American Institute of Accountants, the national professional organization of certified public accountants, and checked for technical accuracy by the Internal Revenue Service.*

### John W. Stang, Sr. dies

John W. Stang, Sr., president of the John W. Stang Corp. of Los Angeles, Tacoma, Omaha, and New York City, and one of America's foremost wellpoint authorities, died December 1, following a heart attack. Stang founded the corporation bearing his name in 1940. Specializing in wellpointing and other phases of hydraulic and dewatering engineering services, it has a world-wide record of completed jobs.

Stang was a member of The Moles, a charter member of The Beavers, and an associate member of The American Society of Civil Engineers.



TO REMOVE high spots and surface irregularities on the section of the Kansas Turnpike that bridges 57th St. in Kansas City, Mo., Rohrer Contracting Co. used a Model H-S Berg Hiway surfacer. The unit has a roughing cutter plate with 12 cutters and a finishing cutter plate with 16 cutters. Each cutter is 2 inches in diameter, 3/16-inch thick, and 18-star pointed. The chuck to which the plates attach revolves at 800 rpm and is driven by a 4-hp air-cooled Wisconsin engine through a uniflex coupling. The rig features a power takeoff to which a flexible shaft and a variety of attachments can be connected for hand finishing and smoothing work. For more information circle No. 269 on the Request Card at page 18, or write to The Concrete Surfacing Machinery Co., 4665–69 Spring Grove Ave., Cincinnati 32, Ohio.

THE ROAD AHEAD (CONTINUED)


# ROAD BUILDERS RISE TO THE CHALLENGE BY WORKING TOGETHER AS NEVER BEFORE

The key to America's fabulous road-building program is co-operation. The men who must make it work are a diversified group—bankers, engineers, contractors, government officials, materials producers, equipment manufacturers. But they are united today by *one goal* and are setting an example of industry co-operation rarely equaled. Here are some examples of how an equipment manufacturer is co-ordinating its activities with all other groups.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

*Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

**BANKERS AND EQUIPMENT MANUFACTURERS.** Some 180 bankers from every sector of the U.S.A. view the latest earthmoving equipment at the world-famous Caterpillar proving ground in Peoria. A two-day program gives them a close-up of new and improved CAT* equipment—like the giant D9 and the new DW21 with its high-capacity LOWBOWL Scraper—which they finance for contractors. A show like this bolsters confidence—makes credit easier.

## Portable blueprinter weighs only 5½ pounds

■ A portable blueprint machine that weighs only 5½ pounds, including carrying case, is announced by Product Engineering Laboratories Co., Inc. The PELprinter 60 operates by a dry vapor process and will reproduce any drawn or written page up to 8½ × 14 inches in size.

The PELprinter 60 requires a 110-volt outlet for operation. It can be adapted for use in automobiles. The reproduction of a page, said to cost approximately one cent, is accomplished in less than 90 seconds.

The portable PELprinter 60, which weighs only 5½ pounds, can reproduce any drawn or written page up to 8½ × 14 inches in size.

Contained in a luggage-type, unbreakable plastic carrying case, the PELprinter 60 is recommended for engineers, superintendents, and other technicians who work in the field.

For further information write to the PELprinter Division, Product Engineering Laboratories Co., Inc., 314 Adam St., Newark 5, N. J., or use the Request Card at page 18. Circle No. 266.

## C&E adds William Allen to editorial staff

CONTRACTORS AND ENGINEERS is pleased to announce the appointment of William A. Allen to its staff as field editor. He comes to this magazine from Boulder, Colorado, where he worked as a field engineer for the Colorado Department of Highways. Bill makes no claim of being a true Westerner, however, for he migrated to Colorado from his home in Massachusetts since World War II.

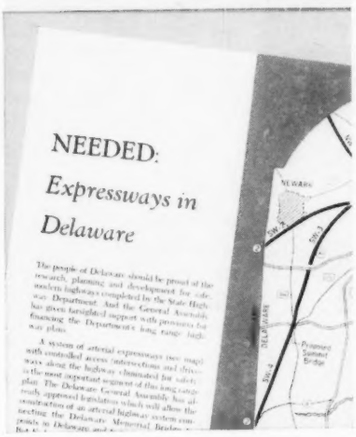
C&E's western field editor, William A. Allen

Allen received his engineering degree from Harvard University in 1944. This was followed by a three-year tour of duty with the U. S. Navy as a lieutenant (j.g.) on an amphibious ship in the Pacific. After the war he took writing courses at Columbia University in New York City, and has several published articles to his credit.

In addition to his service with the Colorado Department of Highways, he has worked for the city of Boulder as a field engineer, and also in the field crew of a land surveyor. Allen and his wife have two children—a boy, 7, and a girl, 5.

**CONTRACTORS, GOVERNMENT OFFICIALS, MATERIALS PRODUCERS AND EQUIPMENT MANUFACTURERS.** The 1957 Road Show in Chicago this month will demonstrate to contractors, government officials and materials producers that the equipment is ready for the job ahead. Caterpillar's exhibit will feature the new road program in detail and will spotlight the machines on which contractors will depend to accomplish the job.

**STATE OFFICIALS AND EQUIPMENT MANUFACTURERS.** This Caterpillar leaflet helped road officials in Delaware get important limited access legislation approved. Caterpillar first featured Delaware in a national advertisement, then local Caterpillar Dealers sent reprints like this to legislators and other interested persons in the state explaining the need for limited access legislation. Bill passed soon after.


NEEDED:
*Expressways in Delaware*

**ENGINEERS AND EQUIPMENT MANUFACTURERS.** Exhaustive on-the-job tests are made on newly designed equipment to help engineers figure capacity, speed of production. Engineers base their estimates and contracts on the known production capabilities of machines—they depend on those machines to perform with minimum down time. Here the Caterpillar DW21 Tractor with No. 470 BOWBOWL Scraper helps meet the engineers' challenge on the Florida Turnpike.

## Charles W. Prisk conducts federal highway study

A study of federal government activities promoting highway safety, authorized by the Federal-Aid Highway Act of 1956, will be conducted by Charles W. Prisk of the Bureau of Public Roads. Prisk was appointed to this post by Federal Highway Administrator John A. Volpe.

The study will evaluate the need for federal assistance to state and local governments in enforcing safety and speed requirements. It will also consider the promotion of uniform state and local highway safety and speed laws.

National organizations assisting in the program include the Research Committee of the Advisory Council of the President's Committee for Traffic Safety and the Roberts Subcommitee of the House of Representatives Committee on Interstate and Foreign Commerce. Offering additional help are the Automotive Safety Foundation, the National Safety Council, and the Public Health Service.

Prisk is a graduate of the Yale Bureau of Highway Traffic and has worked for the Bureau of Public Roads and the American Association of State Highway Officials. He has also served on the Research Committee of the Advisory Council of the President's Committee for Traffic Safety and has completed a term as President of the Institute of Traffic Engineers.

←For more facts, circle No. 411

A BMCO Rockbuster reduces native rock to base-course material for use on a $2.8 million interchange near San Antonio. After the rock was excavated, it was dumped on the roadway grade. It averaged 6 inches in diameter, and was reduced to minus 2 inches in one pass. In our Oct. 1956 issue (p. 46) a different machine was incorrectly credited for the bulk of this work, over 212,000 yards. The BMCO Rockbuster is made by the **Browning Mfg. Co.**, Box 2702, San Antonio, Texas.

## Eight-pound transmitter has range of 30 miles

■ A lightweight mobile radio transmitting and receiving set with an operative range of 30 miles is announced by the Avco Mfg. Corp. The

The Avcom Mark I transmitting and receiving set is similar to the Walkie-Talkie, except that it is more powerful. It weighs 8 pounds and has a range of 30 miles.

Avcom Mark I weighs 8 pounds. The size of a cigar box, it is similar in operation to the Walkie-Talkie, except that it is more powerful.

The Avcom Mark I consists of two sections clipped together. The upper section holds the sending and receiving equipment and the lower section houses the power supply—a wet-cell battery and emergency generator.

The set operates from the rechargeable battery for 10 continuous hours with a duty cycle of five minutes transmitting to each 15 minutes receiving. The transistorized receiver will operate 250 continuous hours on one charge of the battery.

For further information write to the Avco Mfg. Corp., 420 Lexington Ave., New York, N. Y., or use the Request Card at page 18. Circle No. 263.

## Union Building advances J. D. Webb, J. A. Slater

The Union Building & Construction Co. of Passaic, N. J., has appointed J. Duncan Webb president of Union's subsidiary, the Central Florida Construction Co., Miami, Fla. Webb will remain as director and vice president of the company, but his post of treasurer will be filled by James A. Slater.

## IRF appoints La Baugh

The International Road Federation has appointed William C. La Baugh, Jr., as director of engineering. Prior to his appointment, La Baugh was the director of training for the Virginia Department of Highways.

A graduate of Case Institute, La Baugh has worked with the Virginia Department of Highways since 1946. From then until 1954 he had several engineering positions. In August of 1954 he became director of training.

*The cost of concrete blocks has risen only 20 per cent in twenty years, contrasting with a greater rise on other building materials.*

←For more facts, circle No. 412


# If your job calls for PIPE PILES

*"Faster-from-Foster" service pays off in big savings!*

As uses of pipe for piles increase, more and more contractors are calling on L. B. Foster Company for the best and fastest service available. These contractors know us as specialists in steel pipe for piling, in all diameters and wall thicknesses—spiralweld, electricweld, seamless, and lapweld.

On this river-span job we delivered 16-inch diameter Taylor-Forge Spiralweld foundation pipe (in 52 and 60-ft. lengths) as piling for bents of two bridges which span 135-ft. streams. While we are constantly supplying scores of small jobs every day, we'll also deliver all the material required for even the biggest jobs . . . to your job site, and . . . on schedule. No delays for you, no storage problems, more savings.

Send for Foster catalogs—yours for the asking.

SINCE 1901

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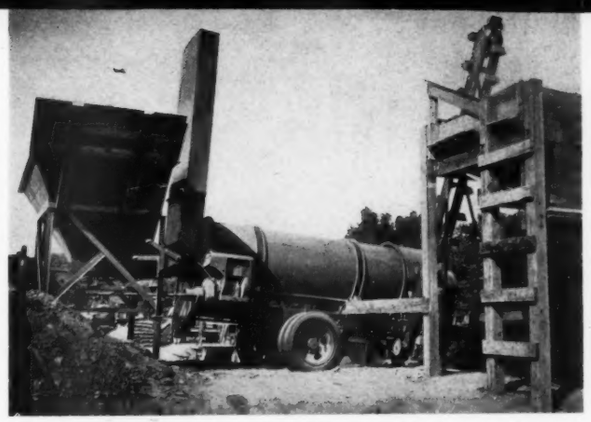
STEEL-SHEET PILING · H-BEARING PILE · STEEL PIPE · RAILS · ALUMINUM PIPE · ALUMINUM BRIDGE RAILING

Working from barges, Brennan Brothers of La Crosse, Wisconsin and Lansing, Iowa placed spiralweld foundation pipe in 8 feet of water, then had to drive through 40 ft. of Mississippi River sand, clay and mud bottom. Piling, supplied by L. B. Foster Co. was concrete capped, each measured 26 x 3 x 2 ft.

Visit Us at the ARBA Convention & Road Show, Booths 59-60

TRACTOR-SCRAPER: Michigan Model 110 has capacity of 8 to 10½ cubic yards and is powered by 165-hp engine. Power train consists of power-shift transmission, torque converter, and planetary wheel axles with locking differentials. Top speed of unit exceeds 30 mph. Construction Machinery Division, **Clark Equipment Co.**, Pipestone Road, Benton Harbor, Mich. Circle No. 286.

*Booths 823, 829 and 831 at ARBA Road Show*



DRYER-FEEDER BIN: Model 25T Trail-O-Dryer has 15-tph capacity based on removal of 5 per cent free moisture and at 310-degree F discharge. Model 5T25 dual feeder bin has 5-ton capacity. Division in bin forms two compartments of 2½ ton capacities for discharging different aggregates. **Littleford Bros., Inc.**, 485 E. Pearl St., Cincinnati 2, Ohio. Circle No. 254.

*Booth 622 at ARBA Road Show*

ROAD BASE COMPACTOR: Lima Roadpacker is equipped with six hydraulically-driven 420-pound "shoes" which provide tamping and vibration action. Working width of six shoes is 13 feet; for narrower widths, outside shoes fold under frame. Travel speed is 30 mph. Construction Equipment Division, **Baldwin-Lima-Hamilton Corp.**, Lima, Ohio. Circle No. 285.

*Booths 506 and 702 at ARBA Road Show*

CRAWLER-LOADER: Model 12 Payloader travels on 15-inch-wide tracks. Bucket has capacity of 1¾ yards. Bucket tip-back at ground level is 40 degrees; pry-over-shoe breakout force is 9,000 pounds. Engine is rear mounted. Power train includes Paylomatic power-shift full-reversing transmission, with three speeds forward and three reverse, and torque converter. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill. Circle No. 287.

*Booths 711 and 726 at ARBA Road Show*

***The new, the improved, and the proven equipment and materials available to you, the contractor, to help you do your job efficiently and profitably during the big construction year ahead. . . .***

**For further information about any product in this section, note the "Circle No." in the caption and circle the corresponding number on the Request Card bound in at this page.**

**The italicized line following many of the captions in this section indicates the manufacturer's booth number at the American Road Builders Association's Road Show or the Associated Equipment Distributors' Condex exhibit, both of which begin during the week of January 27 in Chicago. Illustrated products will not necessarily be exhibited.**

CEMENT TRAILER: Airslide trailer is 18 feet long and discharges its load without any mechanical contact. Air from engine-driven blower seeps through fabric panels to actuate load, permitting it to flow over panels tilted five degrees. This causes load to progress to low discharge point at rear of trailer. Each trailer has capacity of 100 barrels of cement. The discharge rate is 10 to 15 barrels per minute. Trailers are equipped with Lube-Free tandem axles. **Fruehauf Trailer Co.**, 10928 Harper Ave., Detroit 32, Mich. Circle No. 288.

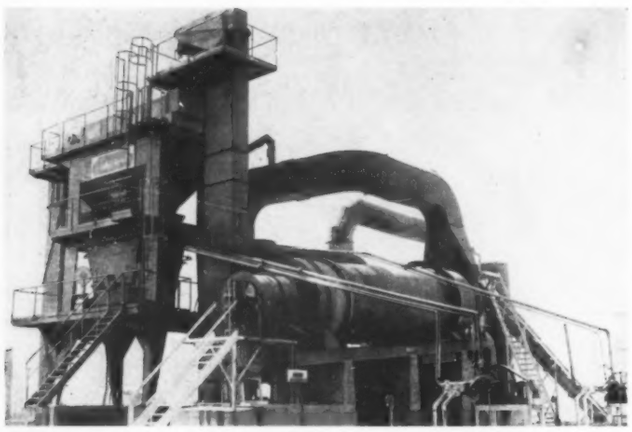
*Booth 615 at ARBA Road Show*

TRANSPORT TRUCK: Transporter has dc electric motor geared to each of six wheels. Regenerative action of motors acts as brakes when rig's speed exceeds motors' speed. Other features are low-pressure, tubeless tires 6 feet tall and 2½ feet wide, and flexible suspension system. Capacity is 35 tons. **R. G. LeTourneau, Inc.,** 2399 S. MacArthur, Longview, Texas. Circle No. 142.

*(Booths 418 and 841 at ARBA Road Show)*

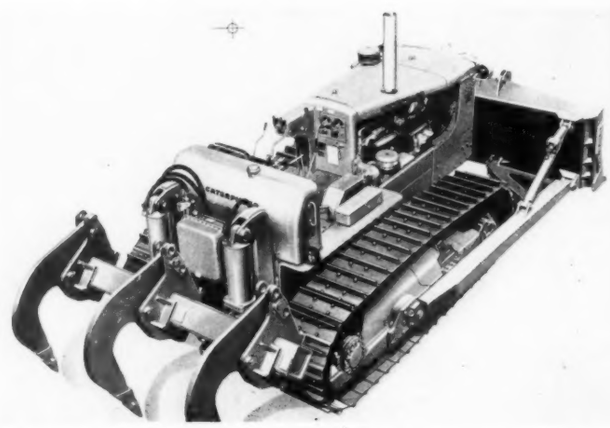
TRANSIT MIXER: Capacity is 6½ cubic yards. Features include enclosed gear-drum drive and ball and socket front-end drum mounting. As mixer travels over uneven ground, ball and socket absorbs all misalignment, protecting drive mechanism. **Westinghouse Transit Mixer Division, LeTourneau-Westinghouse Co.,** 217 S. Belmont Ave., Indianapolis, Ind. Circle No. 135.

*(Booths 705 and 851 at ARBA Road Show)*



ASPHALT PLANT: Model R-M Road Master has capacity of 6,000 pounds and 8-foot-diameter dryer. Reported production exceeds 240 tph. Features include oversized screen, dryer, and elevator; dust seals on all units; simplified push-button controls. **Standard Steel Corp.,** 5087 S. Boyle Ave., Los Angeles, Calif. Circle No. 34.

*(Booth 235 at ARBA Road Show)*



CRAWLER TRACTOR: Horsepower rating on D9 has upped 12 per cent. Flywheel rating is now 320 hp and drawbar rating on direct-drive model is now 260. With torque converter, rig has travel speed of 7.8 mph. Seven-roller track is 90-inch gage; diesel engine is turbocharged. **Caterpillar Tractor Co.,** Peoria, Ill. Circle No. 211.

*(Booths 701 and 720 at ARBA Road Show)*


PUT ALL YOUR PROFITS IN ONE BUCKET!

OMAHA DRAGLINE BUCKET

Omaha Dragline Buckets get out and dig in for you...meaning bigger profits with every load. Alloy steel cutting teeth are tough and sharp. It's faster, smoother working. Nearly 50 years of "know-how" assures quality that lasts in the field. You can't buy a better bucket!

Write today for catalog of complete information and specifications for four types available.

DRAKE-WILLIAMS MOUNT • OMAHA, NEBR.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 413

GOT A BURNING PROBLEM?

YOU NEED AN ASPLUNDH CHIPPER

Saves you the time and cost of loading and hauling brush. Disposal is *right on location*, quickly economically.

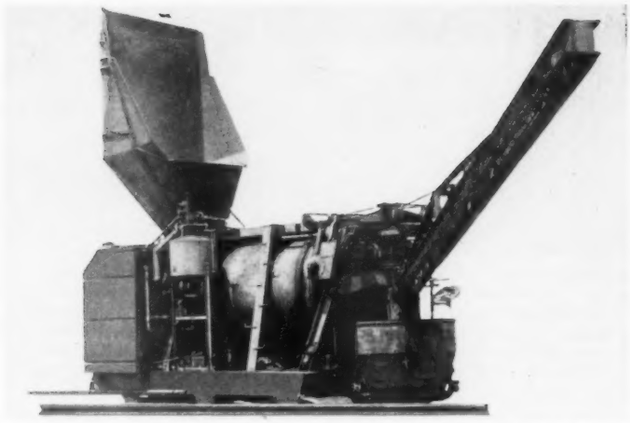
*For free Chipper booklet — write*

ASPLUNDH CHIPPER COMPANY

505 York Road Jenkintown, Pennsylvania

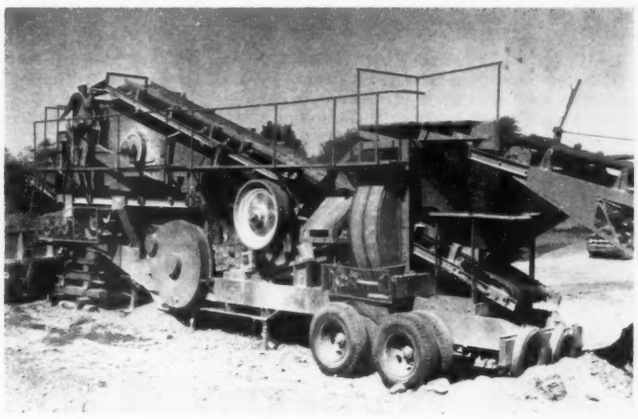
For more facts, use Reader-Reply Card opposite page 18 and circle No. 414

PORTABLE BATCH PLANT: Porto-Plant, said to be largest of its kind in use, delivers more than 100 cubic yards per hour. It requires no field wiring, plumbing, or excavation, just water and power. Operated by one man from push-button panel, it has interlocked cycle that makes incorrect batching impossible. **L. Burmeister Co.**, 4535 W. Mitchell St., Milwaukee, Wis. Circle No. 32.
*(Booth 847 at ARBA Road Show)*



DUAL-DRUM PAVER: Fourteen design and engineering changes have been incorporated into new 34 E paver. Unit features increase in engine speed to 1,800 rpm, hydraulically-operated steering brakes, and redesigned auxiliary water tank with 700-gallon capacity. **Worthington Corp.**, Worthington and Harrison Aves., Harrison, N. J. Circle No. 44.
*(Booth 733 at ARBA Road Show)*

MOTOR GRADER: One of two models powered by Cummins diesel engines, Model 6-D2 is rated at 125 horsepower. Companion unit, Model 7-D2, is rated at 150 horsepower. Features include hydraulically-operated sliding moldboard and combination of torque converter and power-shift transmission. **Huber-Warco Co.**, 202 N. Greenwood St., Marion, Ohio. Circle No. 47.
*(Booth 714 at ARBA Road Show)*

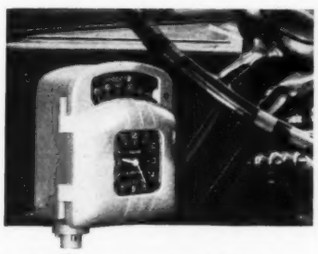


PORTABLE ROCK PLANT: Gasoline engine or electric motor-driven, Type 77 crushing and screening plant has 10×36-inch jaw crusher and 36×32-inch roll crusher. Capacity, based on 25 per cent oversized passing one-inch screen is 160 to 225 cubic yards per hour. **Diamond Iron Works**, Division of Goodman Mfg. Co., Halsted St. & 48th Place, Chicago, Ill. Circle No. 42.
*(Booth 873 at ARBA Road Show)*


*Wagner Sangamo*

**Tachographs**

**provide constant supervision that can *lower truck insurance costs* for your company**



Tachographs provide constant supervision, encourage safer driving habits . . . resulting in fewer reportable accidents and lower insurance rates.

Tachographs are recording speedometers . . . mount easily inside cab . . . automatically record, on wax-coated charts, the complete operation story: when started—stopped—idling time—speed—distance traveled—number of stops. Illuminated dials show time of day, M.P.H. or R.P.M., and total mileage. Red light warns driver when your predetermined speed is exceeded.

Tachographs are a sound investment in more efficient performance and maximum service from your fleet. These precision instruments earn added savings for you through reduced maintenance costs and elimination of lost time. Coupon below brings your copy of Bulletin SU-3 that describes the many advantages Tachographs offer you.

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***Please send a copy of Bulletin SU-3.***

Name and Position_____
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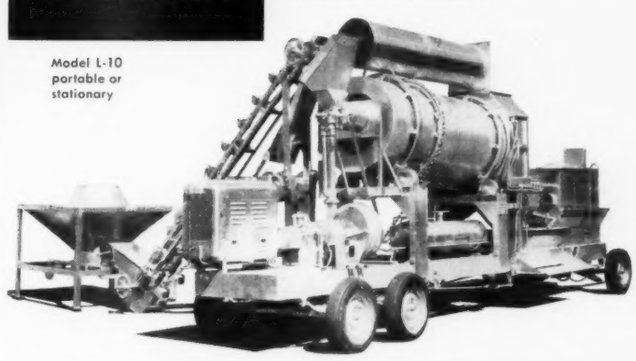
**For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 415**

**White** **NEW ASPHALT PLANT**

$13,500 (f.o.b. factory)

Model L-10 portable or stationary



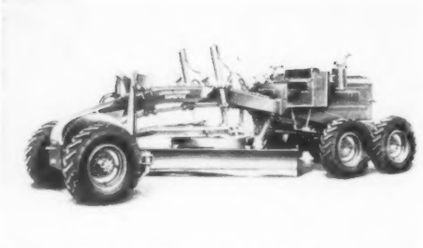
**20 tons per hour hot mix capacity**

Batch type 1000 lb. pug mixer with air-controlled gates. Has built-in asphalt heating kettle, reciprocating plate aggregate feeder. 50 hp engine or 30 hp electric motor. Write for catalog and name of nearest dealer. White Manufacturing Company, Elkhart 9, Indiana.

ONE MAN LOADS . . . ONE MAN OPERATES!

**See it at ARBA Road Show in Chicago, Jan. 28 to Feb. 2.**
**For more facts, use Reader-Reply Card opposite page 18 and circle No. 416**

BACKHOE: Warrior is hydraulic unit for light tractors. It digs 12 feet below ground level and has full swing of 170 degrees through three 120-degree quadrants. Digging power exceeds 4,800 pounds at bucket teeth. **Shawnee Mfg. Co., Inc.**, 1947 N. Topeka Ave., Topeka, Kan. Circle No. 143.



MOTOR GRADER: Super 99 has 6-wheel drive, 6-wheel steer, and optional torque converter. Features include precision sideshift. **Austin Western Works,** Construction Equipment Division, 601 Farnsworth Ave., Aurora, Ill. Circle No. 139.

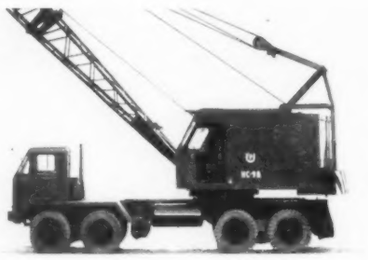
*(Booth 702 at ARBA Road Show)*

BOTTOM-DUMP TRUCK: Model S-12 is rated at 20 tons payload, carries up to 19 cubic yards heaped, and makes non-stop 180-degree turn in 31 feet. **Euclid Division,** General Motors Corp., 1361 Chardon Road, Cleveland 17, Ohio. Circle No. 136.

*(Booths 400, 402, and 416 at ARBA Road Show)*

TRACTOR-SHOVEL: Improved Speedall Model 250D has more rugged Speedmatic power-shift transmission and complete night lighting system. Heaped capacity exceeds 3 cubic yards. **Pettibone Mulliken Corp.,** 4700 W. Division St., Chicago 51, Ill. Circle No. 144.

*(Booth 813 at ARBA Road Show)*



TRUCK-CRANE: Model HC-98 has capacity of 30 tons and features four-axle carrier, optional extra turntable hook rollers, and newly designed jibs in 20, 30, and 40-foot lengths. **Link-Belt Speeder Corp.,** 1201 Sixth St. S. W., Cedar Rapids, Iowa. Circle No. 201.

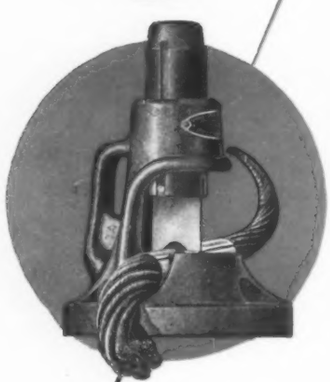
*(Booth 509 at ARBA Road Show)*

TRUCK CRANE: Hydra-Lift now mounted on cab-beside-engine carrier with 144-inch wheelbase. Operator can drive truck, work crane from swivel seat in cab. New hydraulic winch is optional. **Pitman Mfg. Co.,** 300 W. 79th Terrace, Kansas City, Mo. Circle No. 213.

*(Booth 121 at AED Condex Show)*

**Morse-Starrett**
**WIRE ROPE CUTTER**

***CUTS WIRE ROPE***



**FASTER . . .**
Especially designed cutting blade and dies assures fast cutting action. . . . . The hammer principle eliminates any special skill requirements.

**CLEANER . . .**
No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

**SAFER . . .**
The enclosed cutting blade locked in the body of the cutter assures perfect safety.

***and it's***
**PORTABLE . .**
Models for tool kit or stationary operation. With cutting capacities up to: 1 inch, 1 1/16 inch, 1½ inch.

SEE YOUR DEALER OR WRITE DEPT. "M"

**Morse-Starrett Products Company**
**1204 - 49TH AVENUE, OAKLAND 1, CALIF.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 417

THE *BIG PLUS** IN TRANSPORT TRAILERS
*PROVED BY MILLIONS OF MILES

**MODEL SP**

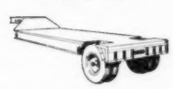
Jack over axle models. Capacities 11 through 25 tons.

**MODEL GTX**

Triple axle, 6 dual wheels. Capacities 25 through 45 tons. Flat or drop deck.

**MODEL TT**

Heavy-duty tilt trailer. Capacities 6, 8 and 10 tons.

**MODEL KS-F**

Single axle flat bed semi, capacities 10 through 20 tons. Drop deck or flat deck.

**MODEL GXTT**

Gooseneck type, tandem axle tilt-trailer. Capacities 14 through 22 tons.

**MODEL GPX**

Tandem axle. Capacities 16 through 35 tons. Drop deck or flat deck.

**MODEL XTT**

Tandem axle tilt trailer (tow type), capacities 13 through 20 tons.

**MODEL T-8-18**

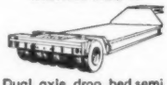
14 or 18 foot length between the wheel tilt trailers. 8-10 ton capacity.

**MODEL GPR**

Removable gooseneck. Tandem, triple or trunnion axles. Flat or drop decks, or as beam trailers.

**MODEL PX**

Heavy-duty tandem axle, spring mounted platform or float.

**MODEL KSO-D**

Dual axle drop bed semi, capacities 15 through 30 tons. Drop deck or flat deck.

**MODEL MSO**

Multiple axle drop bed semi, capacities 35 through 75 tons. Drop deck or flat deck.

**DUMP TRAILERS**

Single or tandem axle models. Standard capacities 8 through 15 yards.

**MODEL PX-O**

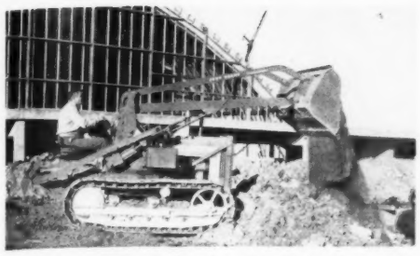
Heavy-duty, self-loading tandem axle oil field float.

WRITE FOR *FREE* CATALOG OF COMPLETE LINE

*"TRANSPORTATION ENGINEERING A SPECIALTY"*

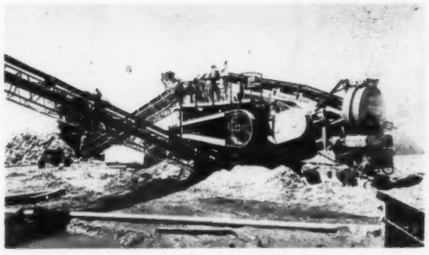
**TRANSPORT TT INC TRAILERS**
**CEDAR RAPIDS IOWA, U.S.A.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 418



CRAWLER-LOADER: Bucket has ⅞-cubic-yard capacity heaped. Rear-mounted three or five-tooth scarifier is optional. Bucket teeth are replaceable. Loader lifts 2,700 pounds to dumping height of 10½ feet. **Deere & Co.**, 3300 River Drive, Moline, Ill. Circle No. 112.
*(Booth 835 at ARBA Road Show)*

DUMP TRUCK: Model LRVSW off-highway six-wheeler is powered by 400-hp engine. Dump body has capacity of 24 cubic yards. Rig has load capacity of 34 tons. Smaller model has 22½-ton capacity. **Mack Trucks, Inc.**, 1355 W. Front St., Plainfield, N. J. Circle No. 87.
*(Booth 803 at ARBA Road Show)*



GRAVEL PLANT: Portable 44V features 30×24-inch twin roll crusher, 10×36-inch overhead eccentric jaw crusher, and four-deck, four-bearing vibrating screed. **Pioneer Engineering Works, Inc.**, 3200 Como Ave., Minneapolis 14, Minn. Circle No. 93.
*(Booth 729 at ARBA Road Show)*

MOTOR SCRAPER: TS-360 is powered by 280-hp engine. Top speed is 20 mph. Capacity is 15 to 20 cubic yards. unit features multiple-disk cable control and air brakes. **Allis-Chalmers Mfg. Co.**, 951 S. 70th St., Milwaukee, Wis. Circle No. 91.
*(Booths 601, 603, and 621 at ARBA Road Show)*

MOTOR GRADER: Model T-700 Grade-O-Matic features torque converter; power-shift transmission; one-inch thick moldboard, 14 feet×30 inches; and V-type, nine-tooth scarifier. The **Galion Iron Works & Mfg. Co.**, Galion, Ohio. Circle No. 105.
*(Booths 711 and 726 at ARBA Road Show)*

TRANSIT MIXER: Transcrete unit's front engine power takeoff provides constant drum rotation regardless of truck gear or road speed. Four models available in mixer capacities up to 7 yards. **Construction Machinery Co.**, 447 Vinton St., Waterloo, Iowa. Circle No. 101.
*(Booth 618 at ARBA Road Show)*

## The LIMA ROADPACKER
## . . . faster high-density compaction at lower cost

The penetrating vibration of six heavy vibrating shoes compacts macadam bases and gravel sub-bases to specified densities.

Course aggregate for macadam bases up to 12" thick can be spread in a single layer, then uniformly compacted to final density over a 13'1" width with the LIMA Roadpacker.

Single spread, which is permissible only with the vibratory method, reduces material handling by one-half or more—it eliminates backtracking of spreading equipment and contour shaping is needed only once.

The action of the vibration "runs in" screenings to full depth of macadam with only three operations. Much of the labor formerly required to spread, broom and roll is eliminated.

The versatile LIMA Roadpacker performs with equal efficiency on both full-width and widening jobs.

**Here's how the LIMA Roadpacker speeds up paving operations.**

- Drives to job at 30 MPH.
- Compacts equally well traveling forward or reverse—no deadheading or turning around when two passes are required.
- Covers a 13-ft., 1-in. width, one half of a two lane road.
- Operator can easily fold end shoes for narrower working widths or for highway travel. Shoes are raised and lowered hydraulically.
- Low maintenance—all working parts are completely enclosed, can even operate under water or dirt. Shoes are driven hydraulically and are pressure-lubricated.

*A fact-filled 4-page folder tells how the new LIMA Roadpacker will help you make more paving profits. Write for your copy today.*

**SEE THE LIMA ROADPACKER AT THE ROAD SHOW, BOOTH 702, SECTION D ANNEX IN CHICAGO, JAN. 28-FEB. 2.**

**LIMA** SHOVELS · CRANES DRAGLINES · PULLSHOVELS — **BALDWIN-LIMA-HAMILTON** Construction Equipment Division — LIMA WORKS

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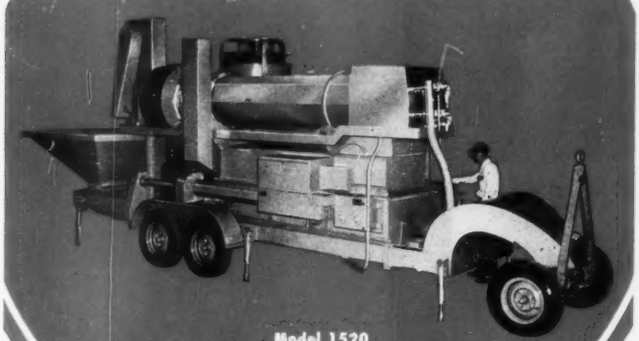
**For more facts, use Reader-Reply Card opposite page 18 and circle No. 419**



## NEW WYLIE ROADMASTER Asphalt Plant



**Model 1520**

★ 15-20 Tons Hourly Capacity
★ Completely Mobile

- Fully automatic batching and asphalt metering cycle
- Rotary dryer with forced draft
- Twin-shaft pugmill with enclosed oil bath gear box
- Enclosed bucket elevator and reciprocating feeder
- 400 gallon asphalt tank
- Cyclone type dust collector

The "1520" meets the demand for a complete self-contained, mobile plant, ready to operate in minutes right at the jobsite. Available also as a skid-mounted unit, with gasoline, diesel or electric power. The Roadmaster is the machine asphalt users have been waiting for — the asphalt plant that has *everything*.

Wylie — Asphalt Equipment

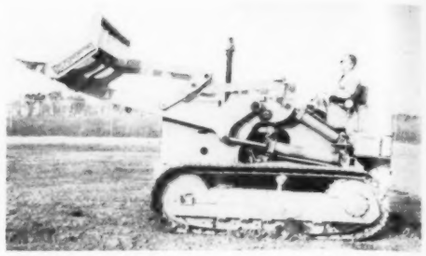
*Send for new 8 page, illustrated brochure*

**WYLIE MANUFACTURING CO., INC.**
P. O. Box 7086, Oklahoma City 12, Okla.

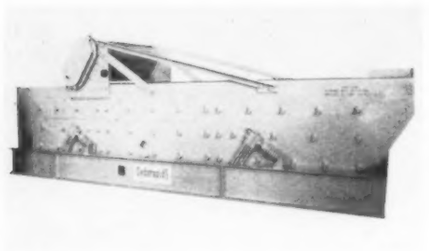
**For more facts, use Reader-Reply Card opposite page 18 and circle No. 420**

VIBRATING SCREED: Designed for bridge decks, unit needs but two men to pull it. Vibrating device, powered by 2½-hp engine, in center of beam. End rollers ride on I-beam rails. **Stow Mfg. Co.**, 40 Shear St., Binghamton, N. Y. Circle No. 71.
*(Booth 339 at ARBA Road Show)*

TRACTOR SHOVEL: Model HO Payloader is a 2¼-cubic-yard, four-wheel-drive, rubber-tired unit featuring 40-degree breakout at ground level, power-shift transmission, and torque-converter drive. **Frank G. Hough Co.** 822 Seventh Ave., Libertyville, Ill. Circle No. 75.
*(Booths 711 and 726 at ARBA Road Show)*



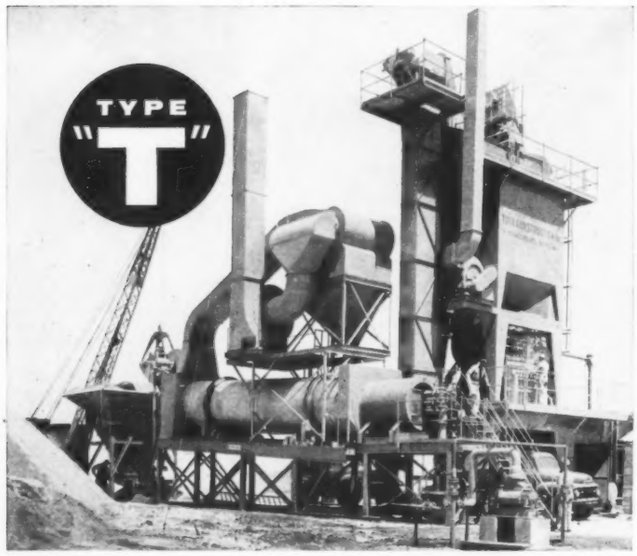
RAKE ATTACHMENT: Device fits Caterpillar No. 977 Traxcavator. It attaches to lift arms and takes place of bucket. Teeth are curved to carry maximum load and stack materials in high places. **Fleco Corp.**, P. O. Box 2370, Jacksonville, Fla. Circle No. 72.
*(Booths 701 and 720 at ARBA Road Show)*



TRIPLE-DECK SCREEN: Cedarapids 60-inch×16-foot horizontal vibrating unit is said to provide 12½ per cent more screening area than comparable inclined screens. **Iowa Mfg. Co.**, 916 N. 16th St., Cedar Rapids, Iowa. Circle No. 102.
*(Booth 723 at ARBA Road Show)*

TRENCHER: Ladder-type Model L-270 is 6 feet wide and digs trench from 25 to 52 inches wide up to 18 inches deep. Pivoting discharge conveyor swings full 180 degrees. **Cleveland Trencher Co.**, 20100 St. Clair Ave., Cleveland, Ohio. Circle No. 103.
*(Booth 417 at ARBA Road Show)*

UTILITY DITCHER: Model 702 takes two different booms and digs up to 30 inches with a 2¼ or 4½-inch bucket line and up to 40 inches with a 2½ or 5-inch bucket line. Top rate of operation is 40 fpm. **Barber-Greene Co.**, 400 N. Highland Ave., Aurora, Ill. Circle No. 114.
*(Booth 722 at ARBA Road Show)*


## 4 Sizes . . . to meet exact requirements
### (Choice of Power)

H & B Type "T" Batch Mix Asphalt Plants are available in four sizes . . . from 60 to 180 tons per hour capacities . . . to meet your exact requirements. Any of these sizes may be had with choice of power . . . with all units driven by individual electric motors (completely factory wired) . . . with gasoline or Diesel engines on the main units and electric drives on the smaller units . . . or with gasoline or Diesel drives throughout.

Other Type "T" features include new structural design . . . all-welded plate construction . . . new type Deister flat screen . . . self-contained dust bin . . . internal, self-contained overflows . . . individual trunnion roll drive on dryer . . . pneumatic controls, etc.

*Bulletin T-55 will be sent on request.*

Special engineering service is available for planning special installations when standard size plants will not meet requirements.

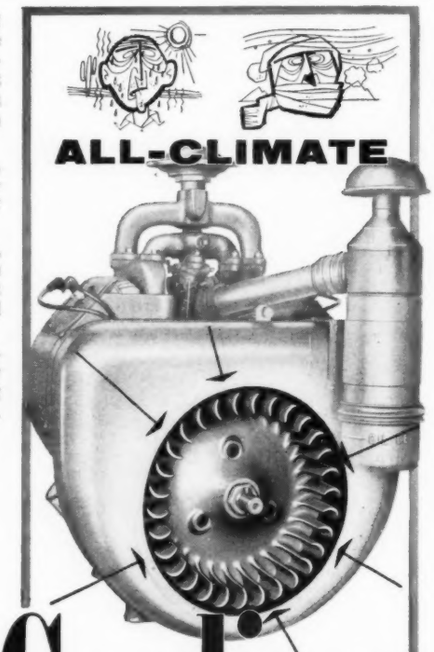
**HETHERINGTON & BERNER INC.** • ***Engineers . . . Manufacturers***
**731 KENTUCKY AVENUE** **INDIANAPOLIS 7, INDIANA**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 421

No *ordinary* cooling system could have done it! To help make Wisconsin Engines first choice everywhere, it took a *special* system with these *finer points.*

- A high-capacity fan, integrally cast with flywheel, pushes more air through engine.
- Time-engineered, time-tested cooling fin design integrally cast in cylinder blocks and heads.
- Scientifically designed and placed air shrouding, providing correct heat dissipation.

The result . . . trouble-free operation, sub-zero to 140° temperatures. Write for S198 . . . handy service map and list of approved service stations.

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**WISCONSIN MOTOR CORPORATION**
MILWAUKEE 46, WISCONSIN
*World's Largest Builders of Heavy-Duty Air-Cooled Engines*

*Better Performance Depends on Better Features....*

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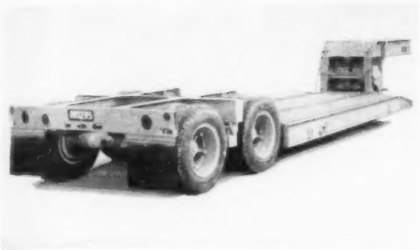
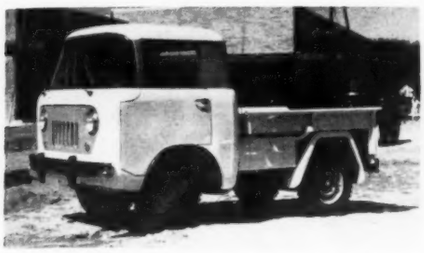


LOW-BED TRAILER: Unit utilizes landing-gear-type hoists to raise and lower gooseneck. With front of frame lowered, equipment can be loaded with little or no blocking. Available in capacities of 15, 20, 25, 30 and 35 tons. **Rogers Bros. Corp.**, 108 Orchard St., Albion, Pa. Circle No. 79.

DUMP TRUCK: Transtar 2-ton model has Torque Star 289-cubic-inch V-8 engine and 131, 155, 171, or 195-inch wheel-base. Maximum gross vehicle weight ranges to 19,000 pounds. Standard equipment includes 15,000-pound rear axle. **Studebaker-Packard Corp.**, South Bend, Ind. Circle No. 77.

TRUCK LOADER: Self-loading bucket has hydraulically operated jaw that swings down and reaches out to meet ground 13 inches forward of bucket lip. Action assures full-load "bite." Standard bucket is ½-cubic yard. **M-B Corp.** New Holstein, Wis. Circle No. 63.
*(Booths 63 and 64 at AED Condex Show)*



UTILITY TRUCK: Forward-control Jeep FC-150 features cab-forward-of-engine design, four-wheel drive, 81-wheelbase, and 18-foot turning radius. Power takeoff at three points (front, center, rear) and four-speed transmission are optional. **Willys Motors, Inc.**, 1505 N. Cove Blvd., Toledo 1, Ohio. Circle No. 62.

CURB AND GUTTER PAVER: Unit has integral tamping attachment which tamps concrete ahead of screed and trowel. Outrigger wheel permits placing curb and gutter as soon as half of roadway has been placed. **Dotmar Industries, Inc.**, 502 Hanselman Bldg., Kalamazoo, Mich. Circle No. 35.
*(Booth 305 at ARBA Road Show)*

CONCRETE BUGGY: Scoot-Crete carries 3,500-pound loads of wet concrete at speeds up to 15 mph. Drive wheels are located directly under load. Buggy can turn in its own length and climbs grades up to 25 degrees. Powered by gasoline or diesel engine. **Getman Bros.**, South Haven, Mich. Circle No. 37.


**Break concrete BETTER · FASTER**

**Brunner & Lay moil points rugged, standard everyday tools.**
**1 ⅛ x 6; 1 ¼ x 6—14″, 18″ & 24″ l.u.c.**

**Sabur® Points for use in concrete with really "tough" aggregate.**
**1 ⅛ x 6; 1 ¼ x 6—14″ & 16″ l.u.c.**

**Keen-Kut—a real concrete buster to increase breakage production.**
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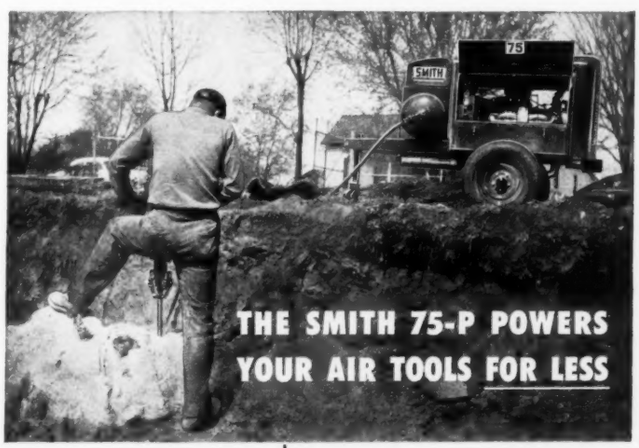
For more facts, use Reader-Reply Card opposite page 18 and circle No. 423






**SMITH 120-P COMPRESSOR**

**SMITH COMPRESSORS ARE IN USE THE WORLD OVER**

**SMITH 45-P COMPRESSOR**

Ask any Smith Compressor owner about economy! He'll tell you how the Smith 75-P replaces big compressors on scores of jobs—*adds to job profits!* The 75-P operates one heavy-duty paving breaker—two medium-duty paving breakers—or one 45-lb. rock drill. Nearly all engine and compressor parts are instantly available at reasonable cost from your Dodge Truck dealer. The 75-P is powered by a Chrysler Industrial Engine, using 3 cylinders for power, 3 for compression. Designed for high compression with large valve area, smooth carburetion. Super-finished bearings and pistons; water-jacketed discharge area. *Send coupon for free literature.*

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Rush free literature on the Smith 75-P ☐ 120-P ☐ 45-P ☐ (Check one or all.)

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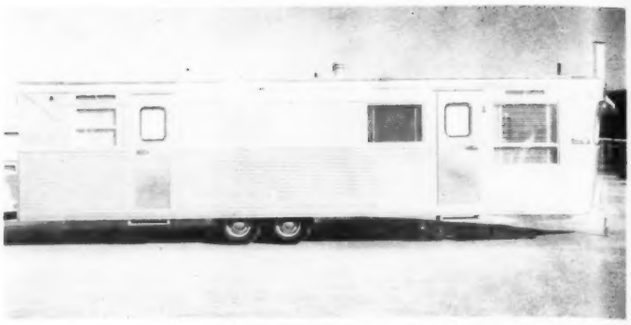
ADDRESS_____

CITY_____ ZONE_____ STATE_____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 424

ROAD PLANE: Features include exclusive hydraulic system that automatically maintains blade on straight line of plane between two ends of machine. Main carrier wheels do not determine elevation. In turning, blade is raised and unit pivots at bowl wheels and rear boom hinges. Bowl and frame are all-welded, eliminating joints or wear points. **Gurries Mfg. Co.**, 1720 S. First St., San Jose 12, Calif. Circle No. 110.



MOBILE OFFICE: Twenty-eight-foot Director is recommended for off-highway uses. Trailer is fabricated of aluminum and features all-riveted aircraft-type construction. Other models are available in 35, 40, 45, and 50-foot lengths. All models ride on tandem axles with brakes at each wheel. **Spartan Aircraft Co.**, Mobile Home Division, 1919 N. Sheridan Road, Tulsa, Okla. Circle No. 151.

What Do You Get In A BUCKET-
BALANCED DIGGING POWER
•
PROPER SHELL DESIGN FOR CAPACITY LOADS
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LOW CENTER OF GRAVITY
OWEN
Plus
"A MOUTHFUL AT EVERY BITE"
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Yes, there are decided differences between OWEN clamshell buckets and clamshell buckets.
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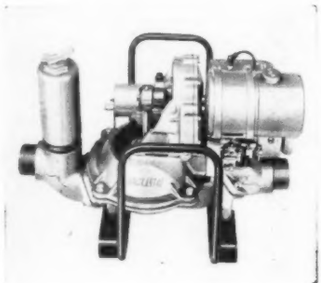
For more facts, use Reader-Reply Card opposite page 18 and circle No. 425

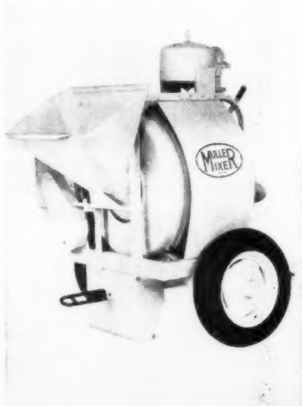

FASTENING TOOL: Power-actuated Duo-Jobmaster uses ⅜ or ¼-inch studs. Features include straight penetration and minimum surface damage in driving special fasteners into such hard materials as concrete and steel. **Ramset Fastening System,** Winchester-Western Division, Olin Mathieson Chemical Corp., 12117 Berea Road, Cleveland 11, Ohio. Circle No. 29.

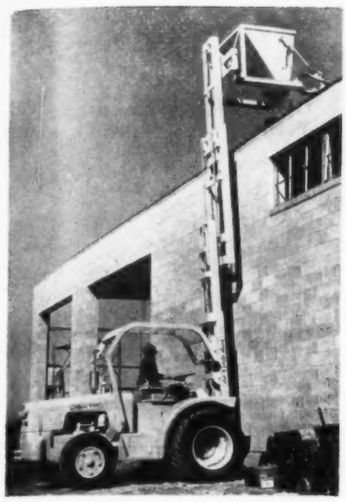
HAND WINCH: Shur-Worm is available in four models with 250 to 1,000-pound capacities. Unit features solid end frame that encloses worm mechanism, offset drum for unobstructed line travel in all direction, steel handles, and steel shafts. Smallest model weighs 9 pounds. **Beebe Bros. Hoist Mfg. Co.**, 2724 Sixth Ave. S., Seattle 4, Wash. Circle No. 53.

DIAPHRAGM PUMP: Model 20DP3 has pumping capacity of 5,000 gph. Unit will dry-prime up to 15 feet in 15 seconds. Suction lift is 28 feet, total head, including friction, is 50 feet. Although unit has 3-inch fittings, it can be adapted to 2-inch lines. **Homelite,** 75 Riverdale Ave., Port Chester, N. Y. Circle No. 214.
*(Booths 401, 500 at ARBA Road Show)*



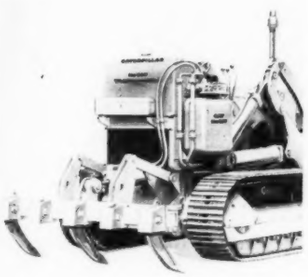
CONCRETE MIXER: Non-tilting unit has drum capacity of 3½ cubic feet. Drum is 27 inches wide and 36 inches in diameter. Discharge opening measures 14 inches in diameter. One-piece chute is 25 inches high in order to facilitate loading of wheelbarrows. **Muller Machinery Co., Inc.** P. O. Box 248, Metuchen, N. J. Circle No. 116.
*(Booths 89 and 112 at AED Condex Show)*



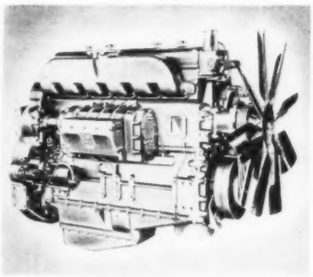


FORK LIFT: Tracto-Lift, for placing palletized materials, raises to height of 21 feet. Special concrete buckets are available. Features include shuttle transmission (six speeds each direction), power steering, and hour meter. Largest model (above) has capacity of 7,000 pounds. Boom attachment converts unit for light steel erection. **Ottawa Steel Division.** L. A. Young Spring & Wire Corp., 5th & Main, Ottawa, Kan. Circle No. 23. *(Booths 97, 98, 103 and 104 at AED Condex Show)*

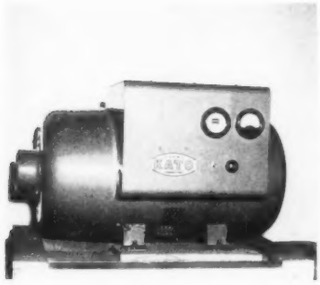
GRAB BUCKET: Unit features link-type hinge alignment device that reduces jamming and breakage when handling extremely hard materials. Interaction of linkage of Carilloy T-1 steel plates entirely replaces gearteeth of conventional hinge alignment devices. **Mead-Morrison Division,** McKiernan-Terry Corp., Harrison, N. J. Circle No. 80. *(Booth 608 at ARBA Road Show)*



RIPPER ATTACHMENT: No. 6 unit fits No. 977 Traxcavator. Smaller size available for No. 955 Traxcavator. No. 6 also fits D6 tractor. Three teeth are standard, five are optional. Parallel linkage maintains same penetration angle at all depths. Teeth have replaceable tips. **Caterpillar Tractor Co.,** Peoria, Ill. Circle No. 118. *(Booths 701, 720 at ARBA Road Show)*

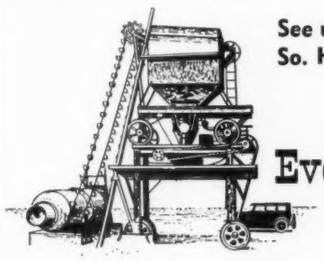


DIESEL ENGINE: Model 6-110 with Roots blower has basic horsepower rating of 300. Use of blower enables reduction in engine dimensions, provides more air for cylinders to improve performance in low-speed ranges. **Detroit Diesel Engine Division,** General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich. Circle No. 149. *(Booth 718 at ARBA Road Show)*



MOTOR-GENERATOR: Set converts dc to ac. Motor and alternator are encased in common frame with single shaft. Operation is at 1,800 rpm. Generator ac output is 120-volt, one-phase, 60-cycle, 2,500 watts. Dc motor is minimum 27½ volts, maximum 29. Lee governor controls motor rpm. **Kato Engineering Co.,** 1415 First Ave., Mankato, Minn. Circle No. 146.

TAMPER: Model 12 combines vibration with impact, and features interchangeable tamping shoes in 12, 18, 24-inch sizes. It operates eight hours on two gallons of gasoline. Weight of self-contained machine is 240 pounds. Unit is said to deliver more pressure per square inch than 10-ton roller. It operates equally well in ditches, roadbeds, next to walls, around pilings, and inside buildings. **The Jay Corp.,** 168 Hosack St., Columbus 7, Ohio. Circle No. 137. *(Booths 15, 16 at AED Condex Show)*

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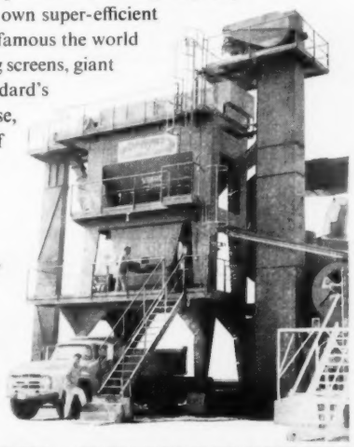
A personal visit to a Standard Asphalt Plant is Standard Steel's best selling aid—true for more than 40 years because Standard has always produced the most efficient, most economical plant in the world! Contractors like the Standard because it's trouble-free, fast acting—*with an extra big capacity and smooth push-button operation!* This large capacity is because of Standard's own super-efficient Standard-Hersey dryer (famous the world over), the large vibrating screens, giant sized elevators, and Standard's exclusive mixer. Of course, all this is typically true of Standard's 40-year leadership.



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**Write us for the complete story. Also the address of a Standard plant located near you. A personal visit to that plant can be your best investment.*

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STANDARD ASPHALT PLANTS

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TAMPER: Workhead of self-propelled rig has six units each of which delivers 4,200 two-ton blows per minute. Units may be arranged in one, two, or three rows to exactly fit widths up to 13¼ feet. **Jackson Vibrators, Inc.** Ludington, Mich. Circle No. 210.
*(Booth 310 at ARBA Road Show)*

SCRAPER: Duo-Scraper is available in 2, 3, and 5-cubic-yard capacities. Of self-loading and spreading design, it can be equipped with rolls for compacting materials as they are spread. **Seaman-Gunnison Corp.**, 2763 S. 27th St., Milwaukee, Wis. Circle No. 226.
*(Booth 308 at ARBA Road Show)*

FRONT-END LOADER: Tracto-Loader TL-12 has bucket capacity of 1⅛ cubic yards and features hydraulic torque converter and clutch-type transmission. It is available with gasoline or diesel engine. **Tractomotive Corp.**, Deerfield, Ill. Circle No. 216.
*(Booths 601, 603, and 621 at ARBA Road Show)*

RAKE ATTACHMENT: BRR brush and root rake fits most crawler tractors and is designed for clearing and piling brush, roots, and small trees. It is available with 7, 9, or 10 teeth, depending on tractor model. **Rockland Allied Equipment Co.**, 3778 W. Colonial Drive, Orlando, Fla. Circle No. 230.

PNEUMATIC COMPACTOR: Model 13W80 pull-type 13-wheel roller covers 95-inch width. Oscillating action of pair-mounted wheels spreads weight evenly. Load per wheel is 2,000 pounds. Body ballast capacity is 115 cubic feet. **Chester Products Co.**, N. Fifth & Ford Blvd., Hamilton, Ohio. Circle No. 207.

CONVEYOR-LOADER: Model 125 HiLoader has capacity of 10 cubic yards per minute of stockpiled or windrowed construction materials and up to 25 cubic yards per minute of snow. **Athey Products Corp.**, 5631 W. 65th St., Chicago, Ill. Circle No. 215.
*(Booths 701 and 720 at ARBA Road Show)*


**15 C.Y.**
**20 C.Y.**

## concrete per hour

ON-THE-JOB BATCHING, MIXING & HAULING

## WITH CONTRACTOR'S WILLARD *portable* PLANT!

SMALL INVESTMENT AND EASY PORTABILITY from job to job are the outstanding features of this *small* Willard plant with the *large* hourly capacity of 15 to 20 cu. yds. of concrete.

Now in less than a day (8 hrs.) you can take down and set up this plant at a new job site and be ready to pour concrete the next day. No moving permits . . . no erection . . . and no foundations to pour.

The complete Willard equipment, consisting of a weigh-batcher, conveyor, sack cement hopper, water meter, skip loader and two truck mixers, costs but a fraction of the price of other small batch-mix plants.

Ask yourself this: Can I make money with a continuous concrete production (batching, mixing and hauling) of 15 to 20 cu. yds. per hour using a crew of only four men?

Get the facts—write for catalog and the low, low cost of this Willard Concrete Plant!

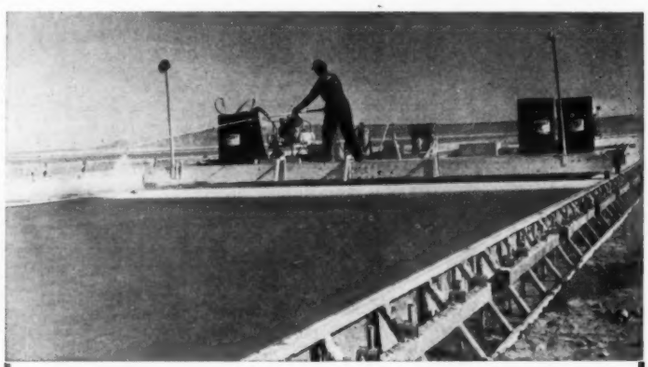
*Manufactured in Los Angeles, California and Galion, Ohio*

**WILLARD CONCRETE MACHINERY COMPANY**
11700 WRIGHT ROAD, LYNWOOD (LOS ANGELES COUNTY), CALIFORNIA

**BATCH and MIX on the job!**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 427





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**concrete curing compounds**

**1 HUNT PROCESS CLEAR**
For natural color of the concrete. A carefully proportioned blend of materials in a petroleum solvent which will not permanently discolor the concrete.

**2 HUNT PROCESS "TILT-UP"**
For curing and bond breaking in "Tilt-Up" or precast construction. Film disintegrates and oxidizes after curing period leaving surfaces in condition for painting.

**3 HUNT PROCESS BLACK**
For curing and waterproofing. A blend of asphalts with pigment in a petroleum solvent.

**4 HUNT PROCESS PIGMENTED—WHITE & GRAY**
For temperature control in the concrete. A curing compound containing high quality pigments which give a heat reflecting film.

**AIR-IN® . . . Air Entraining Agent**
HUNT PROCESS CURING COMPOUNDS AND AIR ENTRAINING AGENTS ARE AVAILABLE IN ALL MAJOR CITIES THROUGH HUNT PROCESS DISTRIBUTORS

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P. O. Box 420, RIDGELAND, MISSISSIPPI

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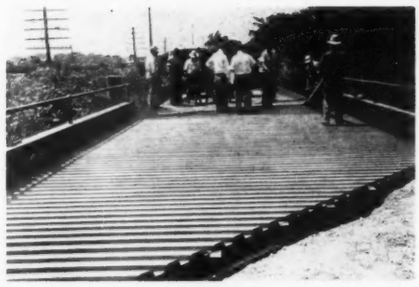
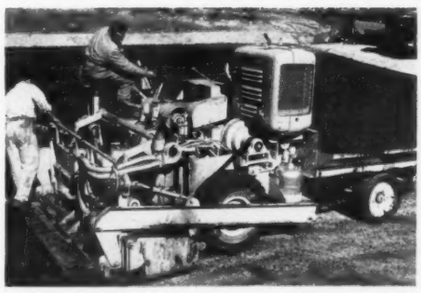
MOBILE CRANE: Model 85A utilizes 4/10-cubic-yard bucket and has 8½-ton capacity. Entire steel main machinery frame is welded in one piece. Steel cab offers 360-degree visibility. **The "Quick-Way" Truck Shovel Co.**, P. O. Box 1800, Denver, Colo. Circle No. 243.

BRIDGE FLOORING: Flooring is recommended for strengthening and stiffening old bridges, viaducts, and similar spans. It is fabricated from 12, 10, or 7-gage steel plate. **United Steel Fabricators, Inc.**, Gasche St., Wooster, Ohio. Circle No. 239.



FRONT-END LOADER: Model 105 operates in 9½ feet of headroom. Dumping height at bottom lip of bucket is 11½ feet. Break-out force at ground level is 40,000 pounds. Maximum load and lift capacity at ground level is 25,000 pounds. Maximum capacity at maximum height is 15,000 pounds. Capacity of bucket is 2½ cubic yards struck. **The Eimco Corp.**, 634-666 S. Fourth West St., Salt Lake City 10, Utah. Circle No. 231.
*(Booth 617 at ARBA Road Show)*

COMPACTION ROLLER: Design of grid is said to produce compaction without scattering. Unit attaches to most prime movers by means of universal hitch. It can accommodate 10 concrete ballast blocks with a total weight of 14,300 pounds. Hitch tongue can be offset 14 inches in either direction for rolling close to obstacles. **Hyster Co.** Tractor Equipment Division, P. O. Box 4318, Portland, Oreg. Circle No. 232.
*(Booths 701 and 720 at ARBA Road Show)*



ASPHALT PAVER: Black Topper Model PF-45 is 14 feet long and 11 feet wide at base. Tamping action is vertical at 1,000 rpm. Maximum screed width is 11 feet. Sections of screed can be blocked or removed for paving down to widths of 8 feet. Hydraulic controls lift screed for 8½-foot clearance. Propane system to provide screed heat is optional. **Blaw-Knox Co.**, 300 Sixth Ave., Pittsburgh 22, Pa. Circle No. 244.
*(Booth 727 at ARBA Road Show)*

**DANGER**

This man doesn't realize he is in danger. But he is. Just look at the old-fashioned shoulder coil of tie wire. It's heavy and clumsy . . . can easily catch on protruding objects . . . must be removed to do other work . . . and, if he picks it up again, the wire ends can scratch his neck or back, or injure his eyes.

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**in the handy reel dispenser**

This man is safe. He's using Cal-Tie Wire in the handy reel dispenser. It's light in weight, and there's no clumsy coil to catch on protruding objects . . . no wire ends which endanger his eyes . . . no chance of infections from scratches . . . no lost time accident. No wonder so many contractors are switching to this modern way of tying re-bars. Why don't you investigate Cal-Tie Wire in the handy reel dispenser today?

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THE COLORADO FUEL AND IRON CORPORATION

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WHEN IT'S **COLD** *keep your job moving*

**Clayton SUMMERAIRE**

**"120"**
**120,000 BTU's**
at 950 cu. ft. of heated air per min.
**$190**

PRE-HEATING MOTORIZED EQUIPMENT FOR EASY STARTING

DRYING NEW CONSTRUCTION: PLASTER, PAINT AND MASONRY

SPACE HEATING SEMI-ENCLOSED WORK AREAS

THAWING OUT FROZEN BULK SHIPMENTS, AGGREGATES, COAL, ETC.

PREVENTING THE FREEZING OF CONCRETE IN CURING STAGE

**Clayton MFG CO.**
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**New Medium Capacity Portable Heater**

Announcing the new Clayton Summeraire "120" Portable Heater . . . a revolutionary "climatizer" especially designed for the construction industry. Small, light, compact, sturdy, the "120" is ideally suited to room-by-room drying of plaster, paint, masonry; for thawing out ground, aggregates, equipment.

**MORE SAFE, ODORLESS HEAT AT LOWER COST**

The Clayton Summeraire "120" delivers 950 cu. ft. of heated air per minute; 120,000 BTU's per hr., producing a temperature rise of 150°F. Burns less than 1 gal. fuel oil or kerosene per hr. Electric solenoid valve cuts off fuel supply in event of power failure. Controlled flame in enclosed combustion chamber insures odorless, fume-free air delivery. Other models in "300" series offer hourly heating capacities up to 375,000 BTU's per hr., electric or gasoline engine driven, with or without automatic thermostat control of pre-set temperatures. Ask for demonstration.

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( ) I'd like a free on-the-job demonstration without obligation

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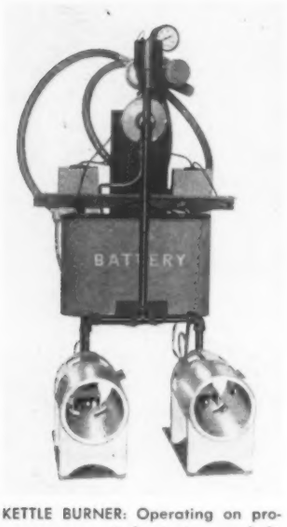
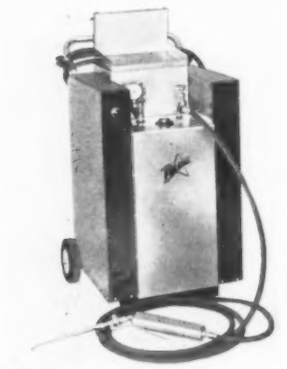



KETTLE BURNER: Operating on propane gas, unit heats tar, asphalt, and pitch, and develops 2,000-degree flame without carbon or soot. **Flamegas Detroit Corp.**, 12901 Auburn Ave., Detroit 23, Mich. Circle No. 25.



STEAM CLEANER: Model 24 is portable, has 6-gallon capacity, works on 110-volt electrical circuit, and generates 90 pounds of pressure. **Elroy Products Co.**, 529 S. Seventh St., Minneapolis 15, Minn. Circle No. 28.

JOIST HANGER: Double width, 14-gage galvanized steel unit; for 4×8, 4×12, and 4×14-inch joists; has long-term loading rating of 1,200 pounds. **F. D. Kees Mfg. Co.**, Beatrice, Neb. Circle No. 49.

WELL POINT: Type 304 is made of stainless steel with continuous slot openings for maximum inlet area. **Edward E. Johnson, Inc.**, 315 N. Pierce St, St. Paul 4, Minn. Circle No. 56.

HYDRAULIC DOZER: Dual-Action dozer now fits Fordson Major tractors equipped with Sherman Model 54E digger. Unit features hydraulically-controlled down pressure and lift. Blade angles to left or right and raises 16 inches off ground. Blade measures 6 feet long. **Arps Corp.**, New Holstein, Wis. Circle No. 24.

MOWER: Tractor-propelled Twin Brute with offset design cuts 12-foot swath. Cutting height is adjustable between 3 and 14 inches. Overrunning-type clutch furnishes additional power to maintain cutter blade speed while tractor gears are changed. Twin 40-hp gear boxes and twin flywheels furnish momentum. **BMB Co., Inc.**, 319-21 New York Ave., Holton, Kan. Circle No. 52.

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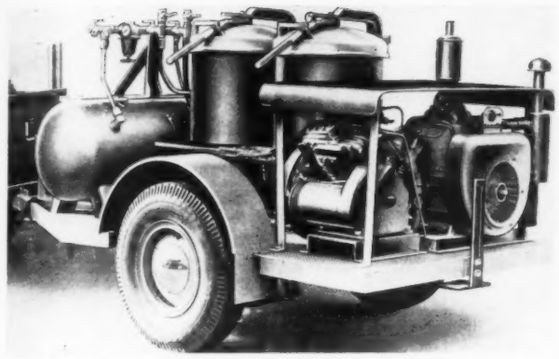
for **POWER . . .**
**DESIGN . . .**
**ECONOMY . .**
**STAMINA . .**

. . . and the unusually good balance of GRIZZLY-KINGS make the big 30x42 size popular for both portable and stationary operation.

While famous Grizzly-King overhead eccentric jaw crushers are available in a full range of sizes from 12 x 36 to 42 x 48, at the present time the larger sizes are most popular due to the expanding needs for crushed stone products. This is particularly true of the 30 x 42 which can out-perform larger, competitive crushers, making it practical for and widely used in both portable and stationary plants. Its lighter weight and size with lower first and operating costs are definite advantages to the contractor who doesn't require the tremendous peak capacity of the 42 x 48 Grizzly-King, or who requires big capacity without forfeiting portability.

All Grizzly-Kings have many design and operating features of proven superiority over the entire jaw crusher field — better balance . . . larger feed opening to take larger rocks and greater feed rates . . . longer jaws for more crushing capacity and better nipping angle . . . larger bearings and shaft for longer, heavy-duty service life and lower maintenance . . . heavy flywheels for greater crushing impact and power savings. These and other advantages of these famous crushers are fully explained in Lippmann Grizzly-King Crusher Bulletin #1100B. Get your copy from your Lippmann Distributor, or write Lippmann Engineering Works, Inc., 4637 W. Mitchell St., Milwaukee 14, Wisconsin and learn the reasons behind Grizzly-King's success.



MASONRY SPRAYER: M-P Colorcrete gun sprays cementitious mixtures, sandblasts, cleans, and provides power for air chisel. Material is mixed in dual tanks mounted on machine. Mixed material is forced through hose to discharge nozzle, where it is combined with compressed air from another hose. Material is applied under regulated pressure. **Colorcrete Industries, Inc.**, 323 Ottawa Ave., Holland, Mich. Circle No. 64.

ROCK BODY mounts on Models 880 and 1000 underbody and Model 77379 telescopic hoists, and is available in capacities of 15 to 25 tons. Features include 15-degree scow end and 45-degree sloping sides. **Galion Allsteel Body Co.**, Galion, Ohio. Circle No. 54.

PAVEMENT BREAKER: New model HydraHammer has larger engine, heavier hammer. Unit delivers maximum blow of 7,500 foot-pounds **Ottawa Steel Division,** L. A. Young Spring & Wire Corp., P. O. Box 39, Ottawa, Kan. Circle No. 310.

*(Booths 97, 98, 103 and 104 at AED Condex Show)*


# LIPPMANN *Grizzly-King* JAW CRUSHERS

**. . . to break rocks faster**

**. . . that breaks rocks easier**

**. . . of long life and lower power costs**

**. . . to give longer service with lower maintenance**

***Here's how a* GRIZZLY-KING'S *bite crushes at lowest costs per ton***

Here approaching the crusher is an unusually large load of stone that is only usual for a Grizzly-King. Two large shovels keep busy satisfying this Grizzly-King's appetite, hour-after-hour.

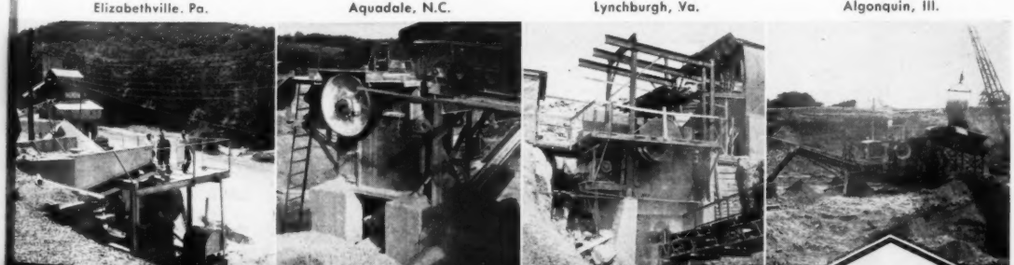
The first stone falls into Grizzly-King's jaws which are wider than others because rated size is measured at minimum jaw eccentric position instead of neutral or maximum as in ordinary crushers.

Now it has dropped into the long, scientifically-curved jaws. Their intermeshing corrugated faces, sure-grip nipping angle and non-choking throat makes every stroke a working stroke.

This shows how, without hesitation, the big rock is easily broken by the very first stroke. The long jaw with the positive nipping angle has prevented slippage, lost time and effort.

*. . . and the pay-off is steady, big production at lower power and maintenance costs . . . easier controlled product size — day-after-day and year-after-year — that has increased profits and lowered costs for operators everywhere. . . .*

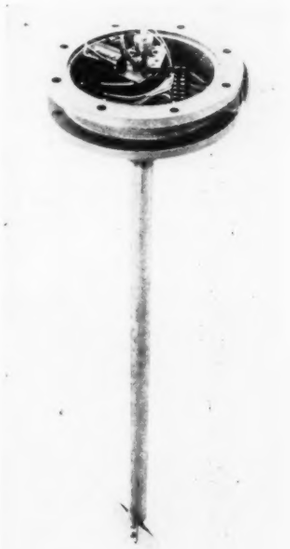
Elizabethville, Pa. Aquadale, N.C. Lynchburgh, Va. Algonquin, Ill.



**LIPPMANN** LEW

CRUSHERS FEEDERS SCREENS CONVEYORS CRUSHING & WASHING PLANTS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 431

LEVEL INDICATOR: Device functions at bin temperatures up to 300 degrees F. It is used for granular or crushed dry materials and is electrically operated. It will automatically operate conveyors and gates. **Fuller Co.**, Fuller Bldg., Catasauqua, Pa. Circle No. 59.

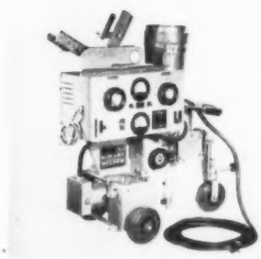
CONCRETE DRILL: Hand-operated Kor-It Junior cuts holes up to 2 inches in diameter through reinforced concrete. **J. F. Hamlin Co., Inc.**, 746 Ellis St., San Francisco 9, Calif. Circle No. 111.

SELF-PROPELLED EXCAVATOR: Model CR-35 has independent travel swing hoist that permits all upper deck machinery to be operated independently of travel mechanism. Clutching and shifting of gears are eliminated during positioning maneuvers by means of no-shift forward-reverse transmission. Outside turning radius is 19½ feet, reported to be among smallest. Rig is convertible to shovel, clamshell, dragline, backhoe, or crane. **Schield Bantam Co.**, Waverly, Ohio. Circle No. 203.
*(Booth 731 at ARBA Road Show)*

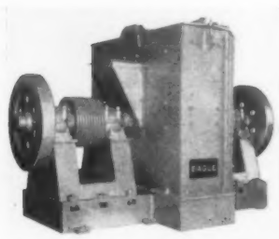
FINISHING MACHINE: Twin floating finisher does 5-foot width in one pass. Two sets of counter-rotating trowels cover large area quickly. Pitch adjustments are made from handle. **Whiteman Mfg. Co.**, 13020 Pierce St., Pacoima, Calif. Circle No. 58.
*(Booths, 20, 21, 22 and 23 at AED Condex Show)*

WET-BATCH DUMP BODY: One-way hauls of 2½ miles or more are possible with Agitator. It can be loaded in four seconds and discharged in 35 seconds. Capacity is 4 cubic yards. Controls can be operated either from ground or platform. **S & M Mfg. Co., Inc.**, 2901 Mill Road, Milwaukee, Wis. Circle No. 57.

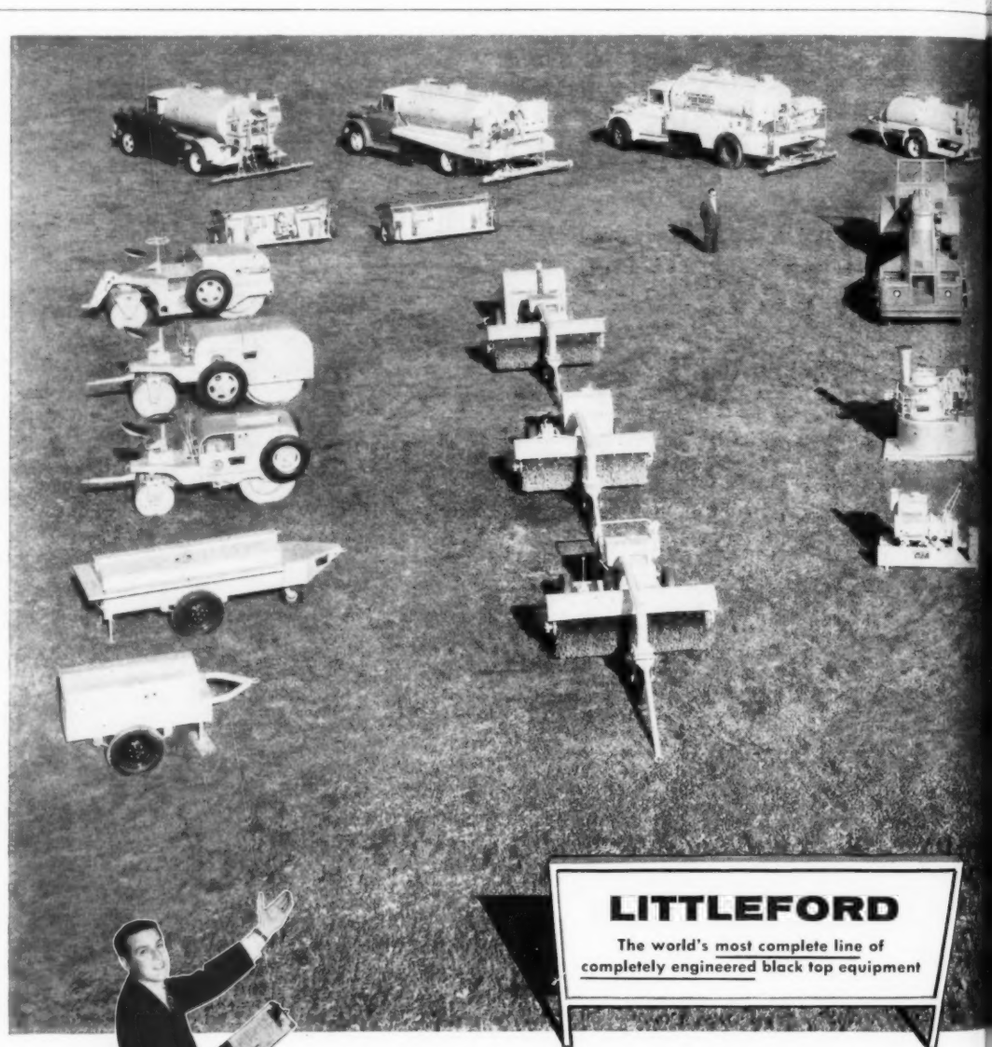
PORTABLE SAW: Model 524 Porta-Band saw is powered by a ½-hp motor. Band speed is 240 surface fpm under load. Saw can be operated by generator when electrical power is not otherwise available. **Porter-Cable Machine Co.**, 59 Exchange St., Syracuse 8, N. Y. Circle No. 60.



SUBMERGED ARC WELDER: Unit is mounted on rubber-tired carriage for welding long seams, straight or curved. Adjustable nozzle permits forming of flat butt or fillet joints. Two models are available. **Hobart Bros. Co.**, Hobart Square, Troy, Ohio. Circle No. 121.



DISINTEGRATING MILL: Four-cage unit is available in three models with outputs ranging to 55 tph. Equipment includes taper-bore bearings of spherical roller type. **Eagle Crusher Co., Inc.**, 124 N. Washington St., Galion, Ohio. Circle No. 97.
*(Booth 606 at ARBA Road Show)*


**...and this is only pa**

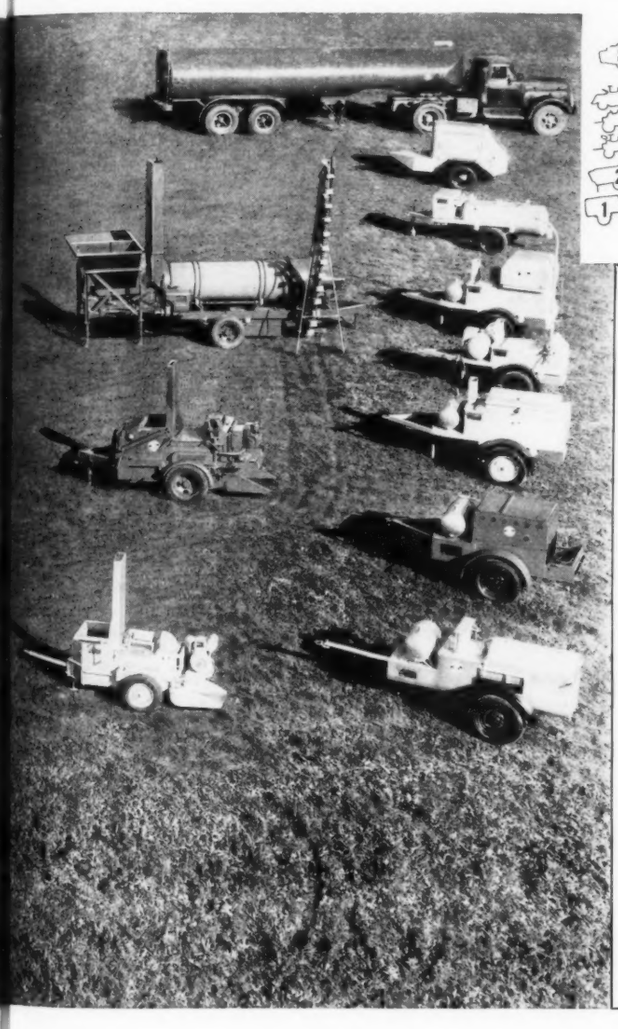
Highway contractors and highway department officials always get exactly the right equipment for black top road construction and maintenance . . . when they buy from Littleford. In addition to the 28 units shown above, Littleford also manufactures dozens of other models and types, in the widest possible variety of sizes.

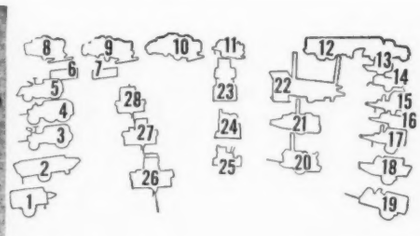
Littleford products are the result of over 50 years intensive research and development by a manufacturer who has kept close contact with—and gained an intimate knowledge of the industry's needs.

MOBILE OFFICE: Trailer is delivered complete with heater, four desks, drawing table, and shelving. Over-all length is 23 feet. Other models up to 56 feet in length are available. Features include aluminum sides, Warner electric brakes, and awning-type windows. Coupler and running gear are hung on 6-inch steel channels. Lights and coupler are ICC-approved. **Atlantic Trailer Corp.**, 9292 Pulaski Highway, Baltimore 20, Md. Circle No. 39.

BACKHOE: Attachment fits Hough Models HH and HU Payloader tractor-shovels. Capacity is 4½ cubic yards. Digging and dumping radius is 190 degrees. Digging reach is 12 feet 4 inches and digging depth is more than 13 feet. Loading height exceeds 9 feet. **Wain-Roy Corp.**, Hubbardston, Mass. Circle No. 38.
*(Booths 711 and 726 at ARBA Road Show)*

ROTARY SNOW PLOW: Model B Sno-Flyr is front-mounted by universal hitch that permits interchange with push plow. Unit can cast snow at rate of 20 tpm up to distance of 75 feet. Casting chute rotates 360 degrees. Plow's cutting width is 8 feet. **Wm. Bros Boiler & Mfg. Co.**, Road Machinery Division, 1057 Tenth Ave. S. E., Minneapolis, Minn. Circle No. 277.
*(Booth 415 at ARBA Road Show)*






**the 28 Littleford units shown are:**

1 Utility splicer box
2 Portable "Handee" tool box
3 2-3 ton portable tandem roller
4 4-6 ton portable tandem roller
5 3-5 ton portable tandem roller
6 True-Lay paver-spreader (with agitator)
7 True-Lay paver-spreader
8 101 Utility spray tank (truck mounted)
9 Spray Leader bituminous distributor
10 Spray Master bituminous distributor
11 101 Utility spray tank (trailer mounted)
12 Bituminous transport tank
13 Portable steam generator—tank car heater
14 Emulsion sprayer
15 Bituminous kettle with barrel warmer
16 Bituminous kettle with spray attachment
17 Bituminous kettle with hand agitator
18 Tool heater and kettle combination
19 Kwik-Melter roofers kettle
20 400 Trail-O-Patcher
21 700 Trail-O-Patcher
22 25T Trail-O-Dryer and bin
23 Heater Planer
24 Kwik-Steam generator
25 Transfer pump
26 Engine driven road broom
27 Traction driven road broom with sprinkler
28 Combination road broom and street flusher

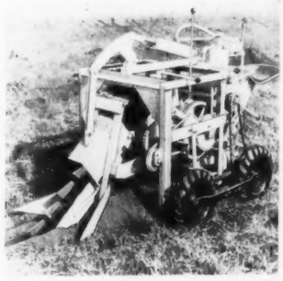
# part of it!

Littleford equipment is internationally distributed by leading equipment dealers . . . wherever you are, there is a Littleford dealer.

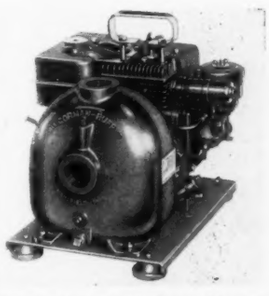
Nowhere else will you find this desirable combination of wide line and top quality. Briefly, this means: *bigger choice, better buy*. For more detailed information, send today for Littleford general catalog GG. Littleford Bros., Inc., dept. LB 246 — 485 E. Pearl St., Cincinnati 2, Ohio.

1882 - 1957 75 LITTLEFORD BROS. INC CINCINNATI TOPS IN BLACK TOP

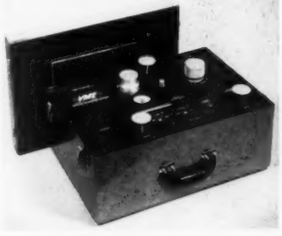
For more facts, use Reader-Reply Card opposite page 18 and circle No. 432



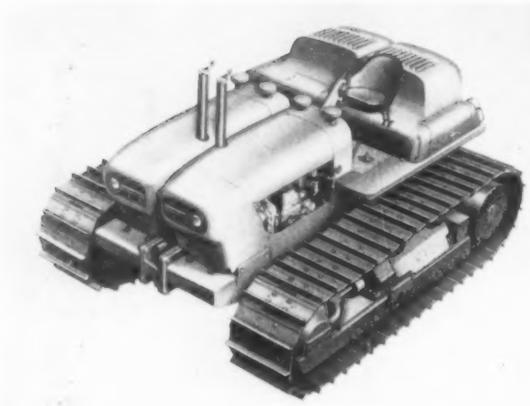
UTILITY DITCHER: Model W-2 Pow-R-Ditcher cuts trench from 2½ to 4 inches wide. It can cut to depth of 3 feet at speeds up to 10 fpm. Unit is powered by gasoline engine and has four-wheel drive. Other models dig trenches up to 2 feet wide. **Vermeer Mfg. Co.**, Pella, Iowa. Circle No. 205.



CENTRIFUGAL PUMP: Series 80 units do not have check valve and feature straight-in suction with the pumped liquid entering pump directly at eye of impeller. **The Gorman Rupp Co.**, 357 N. Bowman St., Mansfield, Ohio. Circle No. 227.
*(Booths 518 and 600 at ARBA Road Show)*



SEISMOGRAPH: Portable unit records blasting tremors and vibrations from pile driving. Records provide data for blasting grids and for evidence in damage suits. **Vibration Measurement Engineers**, 7665 Sheridan Road, Chicago 26, Ill. Circle No. 120.
*(Booth 99 at ARBA Road Show)*



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*(Booth 361 at ARBA Road Show)*


*This is it!*

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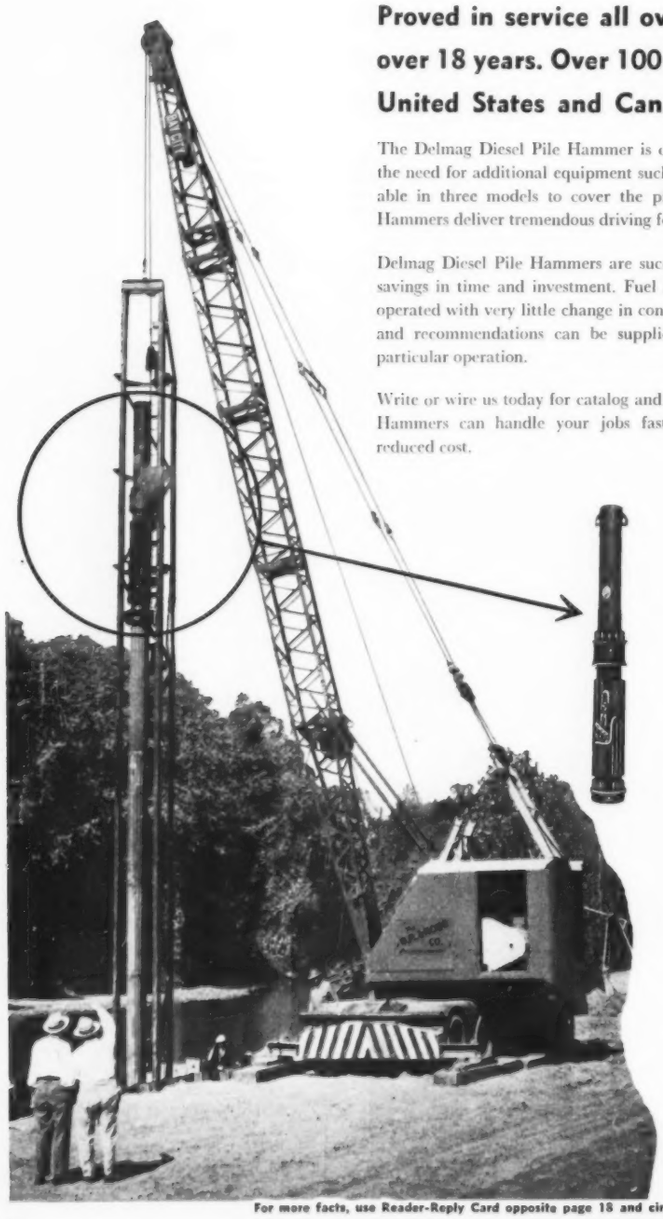

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**MARTZ MACHINERY COMPANY**
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San Francisco 2, California

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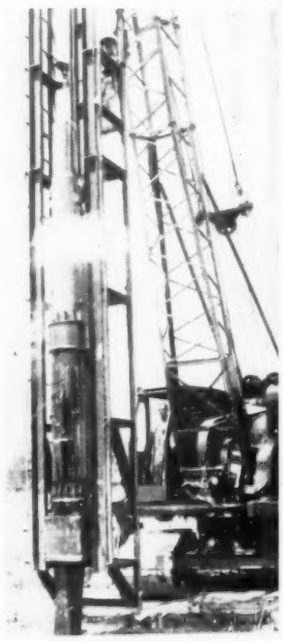

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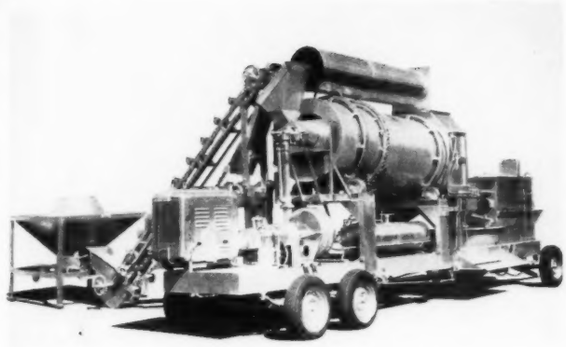
*(Booth 339 at ARBA Road Show)*



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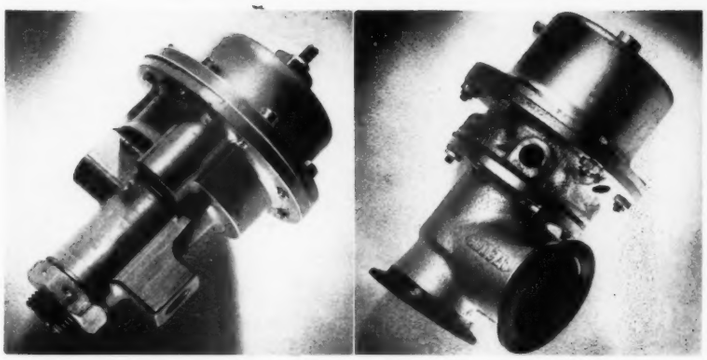

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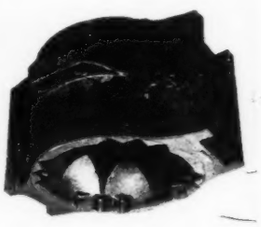

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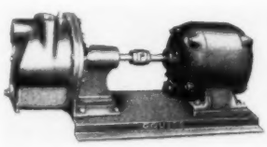

SELF-PRIMING PUMP: Electrically-powered centrifugal unit is primed by water remaining from previous use. Largest of four models has 5-hp motor and capacity of 120 gpm for 25-foot suction lift and 135-foot head. **Goulds Pumps, Inc.**, 19 Black Brook Road, Seneca Falls, N. Y. Circle No. 51.

LEVELING ROD: Portable rod consists of three sections. Total length is 10 feet. Vernier on target reads to .001 foot. Rod can be used in two sections for heights up to 6.7 feet. Dimensions are graduated in tenths and hundredths. **C. L. Berger & Sons, Inc.**, 37 Williams St., Boston, Mass. Circle No. 55.


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*A versatile self-propelled scraper*

*that brings self-loading savings to everyone!*

No matter whether you're a small contractor in need of a *first* self-propelled scraper...or a large contractor needing a *fill-in* rig—this amazingly low-priced Oliver is your first practical answer.

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Profit from its better self-loading ability in all forms of scraper work in earth, sand—digging, moving, grading, filling, dumping, and spreading.

It's tops for visibility and operating ease with exclusive low-mount hitch and finger-tip hydraulic control. It loads fast and full with special curved bowl design. High sweep apron with positive roll-out ejection gives clean, controlled spreading. It's 100% hydraulic; no cables anywhere!

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**VITAL STATISTICS**

**Capacity**—6.7 cu. yd. heaped
**Power**—GM Industrial 3-cyl., 83 h.p. diesel
**Transmission**—6-speed selective transmission (torque converter optional)
**Steering**—Positive hydraulic
**Dimensions**—19'1" (scraper); 30' scraper and tractor; 8'6¼" width
**Tires**—14.00 x 20 scraper; 18.00 x 26 tractor
**Control**—Fully hydraulic

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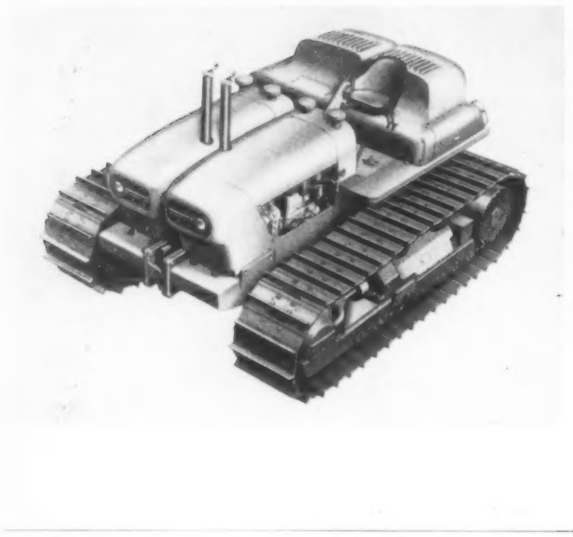

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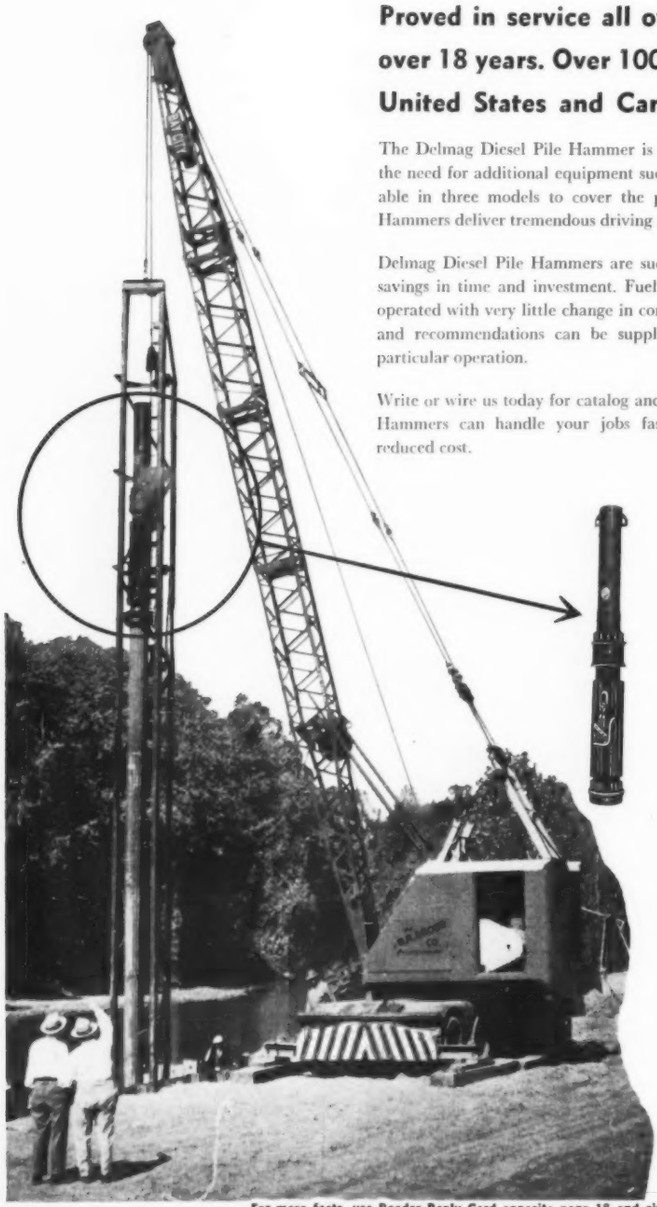

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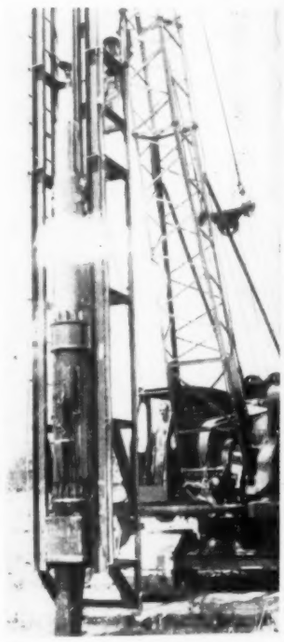

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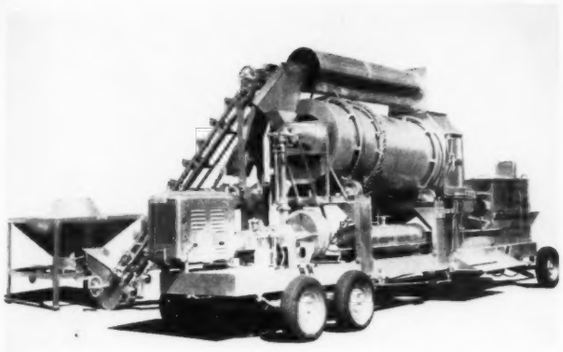

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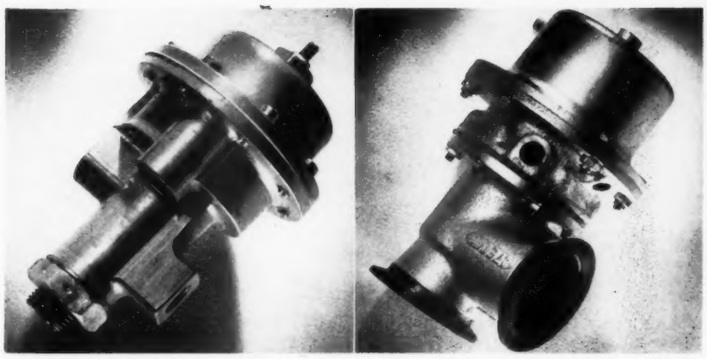

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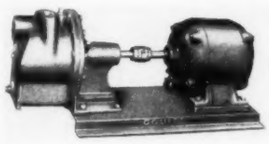
DRIVE CAPS: Units, used on diesel-operated pile hammers in driving pipe, H-beams, timber piles, or concrete piles (with filler pad), are available in 11 sizes, each for specific sized hammer in specific leads. **McKiernan-Terry Corp.**, 100 Richard Ave., Dover, N. J. Circle No. 65. *(Booth 608 at ARBA Road Show)*



SELF-PRIMING PUMP: Electrically-powered centrifugal unit is primed by water remaining from previous use. Largest of four models has 5-hp motor and capacity of 120 gpm for 25-foot suction lift and 135-foot head. **Goulds Pumps, Inc.**, 19 Black Brook Road, Seneca Falls, N. Y. Circle No. 51.

LEVELING ROD: Portable rod consists of three sections. Total length is 10 feet. Vernier on target reads to .001 foot. Rod can be used in two sections for heights up to 6.7 feet. Dimensions are graduated in tenths and hundredths. **C. L. Berger & Sons, Inc.**, 37 Williams St., Boston, Mass. Circle No. 55.


# AT LAST!

*A versatile self-propelled scraper*

*that brings self-loading savings to everyone!*

No matter whether you're a small contractor in need of a *first* self-propelled scraper...or a large contractor needing a *fill-in* rig—this amazingly low-priced Oliver is your first practical answer.

These are the facts: this all-hydraulic scraper is powered for the job, sized for the road and priced so you can have it *now!* It's fast, versatile, maneuverable and able.

Profit from its better self-loading ability in all forms of scraper work in earth, sand—digging, moving, grading, filling, dumping, and spreading.

It's tops for visibility and operating ease with exclusive low-mount hitch and finger-tip hydraulic control. It loads fast and full with special curved bowl design. High sweep apron with positive roll-out ejection gives clean, controlled spreading. It's 100% hydraulic; no cables anywhere!

All this in a more versatile, job-extending self-propelled at an easily afforded price that's actually *thousands* of dollars under other rigs. See your Oliver distributor.

**VITAL STATISTICS**

**Capacity**—6.7 cu. yd. heaped
**Power**—GM industrial 3-cyl., 83 h.p. diesel
**Transmission**—6-speed selective transmission (torque converter optional)
**Steering**—Positive hydraulic
**Dimensions**—19'1" (scraper); 30' scraper and tractor; 8'6¼" width
**Tires**—14.00 x 20 scraper; 18.00 x 26 tractor
**Control**—Fully hydraulic

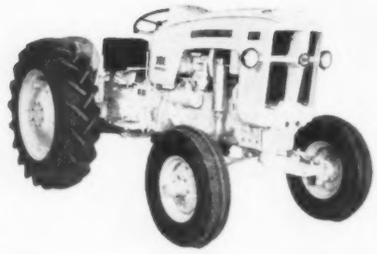
***Get yours!***

This complete picture and fact bulletin of America's lowest priced self-propelled scraper. Write now!

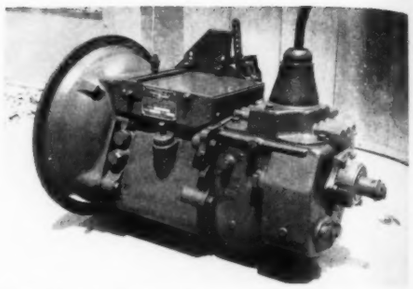
OLIVER **THE OLIVER CORPORATION**
400 W. Madison Street, Chicago 6, Illinois

**a complete line of industrial wheel and crawler tractors and matched allied equipment**
For more facts, use Reader-Reply Card opposite page 18 and circle No. 434

HYDRAULIC BACKHOE: Davis Model 210 mounts on rear of one-ton or larger flat-bed truck by means of special truck-attaching kit. Unit has rotary hydraulic cylinder that allows continuous 200-degree operating arc. **Mid-Western Industries, Inc.,** 1009 S. West St., Wichita, Kans. Circle No. 78.

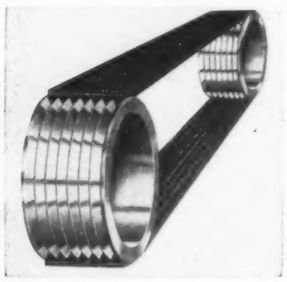


TRACTOR: Model 445, powered by 57-hp engine, has integral power steering, transmission with 10 speeds forward and two reverse, three-point hitch, and choice of rear-mounted hydraulic pumps. **Minneapolis-Moline Co.,** Box 1050, Minneapolis, Minn. Circle No. 113.
*(Booth 226 at ARBA Road Show)*



CLUTCH-TORQUE CONVERTER: Revers-O-Matic allows reversing without shifting. Single lever controls speed and direction. Unit available with or without transmission. Twin pedals in place of lever, to free both hands, are optional. **Funk Aircraft Co.,** 3315 Airport Drive, Coffeyville, Kans. Circle No. 61.

ASPHALT SAMPLER: Bico-Braun-Dulin Rotarex sampler determines bitumen content and gradation of aggregates in bitulithic paving materials. Unit is available in models with 500, 1,000, and 1,500-gram capacities, hand or motor-driven. Two explosion-proof models also available. **Bico, Inc.,** 3116 Valhalla Drive, Burbank, Calif. Circle No. 46.



TRANSMISSION BELTING: Poly-V "one-piece" multiple V-belting extends entire width of sheave. Parallel ribs on face of belting completely fill mating sheave grooves. Two cross-section sizes will handle all power requirements. **Manhattan Rubber Division,** Raybestos-Manhattan, Inc., 92 Townsend St., Passaic, N. J. Circle No. 45.

DIAPHRAGM PUMP: Improved version has spring-bottom bowl that is shock-absorbing and self-cleaning, preventing deposits from building up and protecting against shock. Four-inch model is rated at 6,000 gph at 10-foot suction lift. **Jaeger Machine Co.,** 550 W. Spring St., Columbus, Ohio. Circle No. 41.
*(Booth 704 at ARBA Road Show)*


## Announcing the all new 4/10 yard, 8½ ton 85A "QUICK-WAY"...a a...CR

When you can make money with a small outfit, think how much more money you can make with the husky *"QUICK-WAY"* 85A. Why be satisfied with a 6 or 7 tons in the 3/8 yard class when you can get 8½ tons in the 4/10 yard *"QUICK-WAY"* 85A—and for approximately the same price.

The new *"QUICK-WAY"* 85A has more Big Shovel Features than any other in the small shovel field.

It has been engineered to meet rugged, heavy-duty specifications with fewer moving parts. The power train is oversize, all shafts are splined for easy maintenance. Extra strength has been built in the machinery frame and gantry for greater lifting power.

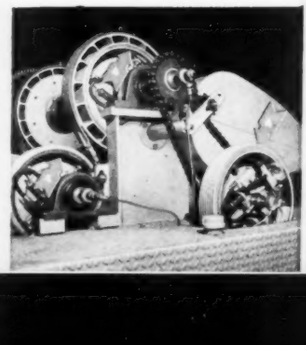
For the owner, the *"QUICK-WAY"* 85A is a quality machine, designed to deliver more efficient performance per pound and per dollar than many more costly machines.

For the operator, the *"QUICK-WAY"* 85A has been simplified for easy, economical maintenance of all parts. It operates smoothly and quietly for maximum production and minimum operator fatigue.

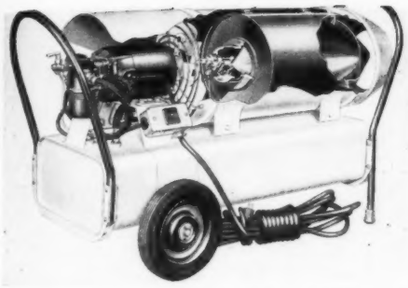
You owe it to yourself to see the new *"QUICK-WAY"* 85A before you buy any shovel at any price. See your distributor for a demonstration and get the real facts on how you can make more money with the husky *"QUICK-WAY"* 85A.

## THE ONE SMAL...HO...

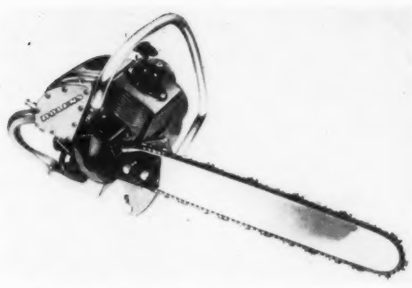
1. **SIMPLIFIED CHAIN AND ... DRIVE** for efficient, quiet ... tion—the combination of ... chains and precision mod... gears gives efficient transm... of power through the mi... number of moving parts. ... simple, efficient design pro... quiet, low-maintenance opera... Stand. engine 47 HP @ 1800 ...
2. **MAIN HOIST AND HAUL ... DRUMS**—are mounted on a ... accessible shaft with sealed ... precision design ... friction bearings. Two-piece ... operation. A ... laggings are easily changed ... it contains po... different operations. Large ... and brake drums have sepa... surfaces with louvres for ... quick attachi...
3. **LARGE SWING DRUMS** ... ribbed for cooling—and are m... ed on a king-sized horizontal ... shaft. Swing brakes are op... Vertical swing shaft is mount... double anti-friction bearing ... top with an anti-friction ... roller bearing at bottom. ... piece, bonded brake linings ... vide more surface for smo... cooler operation.
4. **OVERSIZE CLUTCHES** have ... surface—for smoother, positive ... tion. All clutches are hydrau... operated for easy, sure op... tion of power. Hydraulic ... controls operate with minimu... fort and give the operator th... of the load at all times.



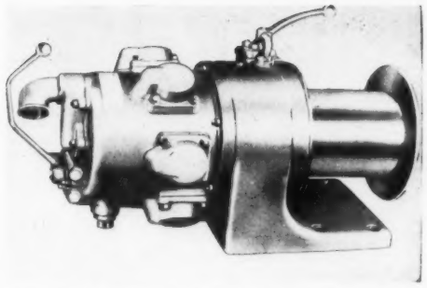
**"QUICK-WAY"®** TRUCK SHOVEL CO.
A Penn-Texas Subsidiary DENVER, COLORADO



PORTABLE HEATER: Model B-100 has stainless steel combustion chamber, pump, and burner-head assembly for less noise and more efficiency. Capacity is 100,000 Btu per hour. **Master Vibrator Co.**, 1752 Stanley Ave., Dayton 1, Ohio. Circle No. 104.
*(Booth 330 at ARBA Road Show)*



CHAIN SAW: Series 3500 direct-drive unit has all-position carburetor. Bars are available in 14, 20, and 24-inch lengths. Chain speed exceeds 1,800 fpm. **Bolens Products Division**, Food Machinery & Chemical Corp., 215 S. Park, Port Washington, Wis. Circle No. 83.
*(Booth 88 at ARBA Road Show)*

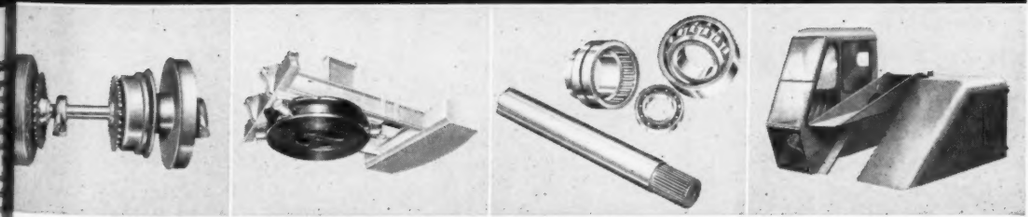


PNEUMATIC HOIST: Model MHG-41 is portable winch-type unit that operates at air pressure of 85 psi. Unit works at speeds of from creep to 160 fpm under full 1,100-pound load. Equipment includes 400 feet of 5/16-inch wire rope. **Atlas Copco Eastern, Inc.**, P. O. Box 2568, Paterson, N. J. Circle No. 73.


# ...and the "QUICK-WAY" all new CRAWLERS 85 AC & 105 AC

Now you can get the ***"QUICK-WAY"*** 85A and 105A on a crawler! You get the same ***"QUICK-WAY"*** Big Shovel Features on the crawler that gets to its job, stays with the work, even in close, restrictive quarters. The new ***"QUICK-WAY"*** Crawler has independent travel—forward and reverse speeds of 7/8 miles per hour in low range and 1-3/4 miles per hour in high range. It is now available in 16" crawler shoes (5.1 psi ground pressure), 24" crawler shoes (3.5 psi ground pressure), and 32" crawler shoes (2.5 psi ground pressure). Width of 95" has been especially designed for hauling on trailers.

## ...HOVEL WITH BIG SHOVEL FEATURES



**...OWER UP AND DOWN BOOM ...OIST IS STANDARD**—A simple ...ecision design makes safe, sure ...peration. A one-piece cast steel ...it contains pawl teeth, windlass ...d brake drum. The cable end is ...cated in an easily accessible place ... quick attachment change-over.

**ONE-PIECE FLOOR FRAME, HEAVY DUTY SWING TABLE GEAR AND HOOK ROLLERS**—Floor frame electric welded in jig, then all bearing mounts machined at one time for precision alignment. One-piece, cast steel swing table gear. Four hook rollers distribute load.

**ALL SHAFTS SPLINED, ALL ANTI-FRICTION BEARINGS**—All shafts extra large for maximum strength, precision splined for easy maintenance. Anti-friction bearings used on all high-speed, continuous rotating shafts and drums. All shaft bearing surfaces are precision ground.

**MACHINERY HOUSING DESIGNED FOR COMPLETE, EASY ACCESS**—to all machinery. New feature is an automobile hood-type cable trough cover that lifts high for complete access to central machinery. New cab has 360° vision through removable safety-glass windows.

**MOST COMPLETE LINE...WITH 5 MODELS IN THE SMALL SHOVEL FIELD!**

105A & 105AC
5/10 YD., 10½ TONS

125A
6/10 YD., 12½ TONS

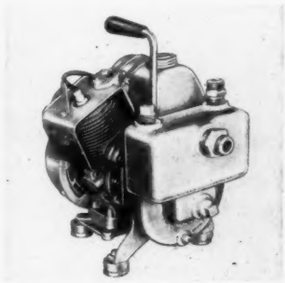
*with the famous money-making line of "QUICK-WAY" attachments for all models.*

***Get these important books . . . free!***

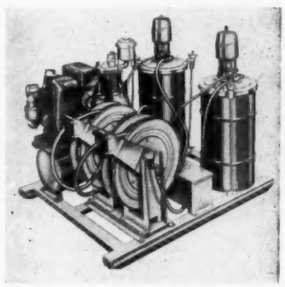
- ☐ The new catalog on the *"QUICK-WAY"* 85A and 85AC Crawler.
- ☐ The new catalog on the *"QUICK-WAY"* 105A and 105AC Crawler.
- ☐ The new catalog on the *"QUICK-WAY"* 125A.

**"QUICK-WAY" TRUCK SHOVEL CO., Dept. 27**
**2401 East 40th Ave., Denver 5, Colorado, U.S.A.**

*Name*.....*Title*.....
*Company*.....
*Address*.....
*City and State*.....

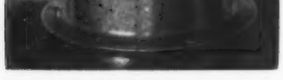
SELF-PRIMING PUMP: Pick-Up Pumper has rated suction lift of 25 feet. Centrifugal-type unit is powered by 2-cycle, 1½ or 2-hp gasoline engine and weighs 27 pounds. Pump features enclosed cooling fan and rubber-cushion mounting. **Construction Machinery Co.**, 447 Vinton St., Waterloo, Iowa. Circle No. 48.
*(Booth 618 at ARBA Road Show)*



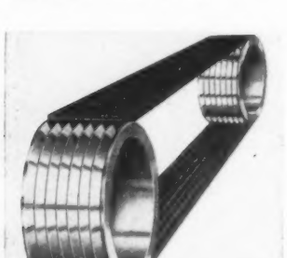
LUBRICATOR: Portable Convoy Luber mounts on steel frame with hardwood skids for field use. Equipment includes two reels of dispensing hose, high and low pressure Fire-Ball pumps, 7.5-cfm compressor, and tool box. Unit can be carried easily in rear of pick-up truck. **Gray Co., Inc.**, 1059A Sibley St., N. E., Minneapolis 13, Minn. Circle No. 33.

DRAGLINE BUCKET: Model BL is light-duty 3-cubic-yard unit with solid or perforated basket made of Becoloy, a special steel alloy. Solid or two-part Becoloy teeth are available. Two other models handle medium and heavy digging operations. **Bucyrus-Erie Co.**, South Milwaukee, Wis. Circle No. 108.
*(Booth 514 at ARBA Road Show)*

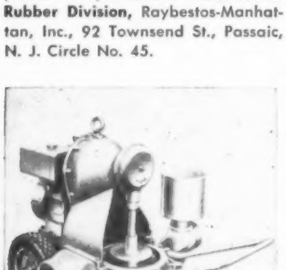
←For more facts, use coupon or circle No. 435



ASPHALT SAMPLER: Bico-Braun-Dulin Rotarex sampler determines bitumen content and gradation of aggregates in bitulithic paving materials. Unit is available in models with 500, 1,000, and 1,500-gram capacities, hand or motor-driven. Two explosion-proof models also available. **Bico, Inc.,** 3116 Valhalla Drive, Burbank, Calif. Circle No. 46.



TRANSMISSION BELTING: Poly-V "one-piece" multiple V-belting extends entire width of sheave. Parallel ribs on face of belting completely fill mating sheave grooves. Two cross-section sizes will handle all power requirements. **Manhattan Rubber Division,** Raybestos-Manhattan, Inc., 92 Townsend St., Passaic, N. J. Circle No. 45.



DIAPHRAGM PUMP: Improved version has spring-bottom bowl that is shock-absorbing and self-cleaning, preventing deposits from building up and protecting against shock. Four-inch model is rated at 6,000 gph at 10-foot suction lift. **Jaeger Machine Co.,** 550 W. Spring St., Columbus, Ohio. Circle No. 41.
*(Booth 704 at ARBA Road Show)*


85A QUICK-WAY ..

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"QUICK-WAY"® TRUCK SHOVEL CO.
A Pre-Texas Subsidiary DENVER, COLORADO

THE ONE SMAL HOV

1. **SIMPLIFIED CHAIN AND G DRIVE** for efficient, quiet o tion—the combination of chains and precision mach gears gives efficient transm of power through the mini number of moving parts. simple, efficient design pro quiet, low-maintenance opera Stand. engine 47 HP @ 1800
2. **MAIN HOIST AND HAUL W DRUMS**—are mounted on a ma accessible shaft with sealed cision design friction bearings. Two-piece eration. A c laggings are easily changed it contains pa different operations. Large d brake drum and brake drums have sepa cated in an ea surfaces with louvres for coo quick attachm
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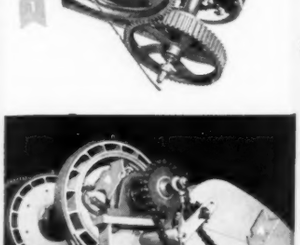
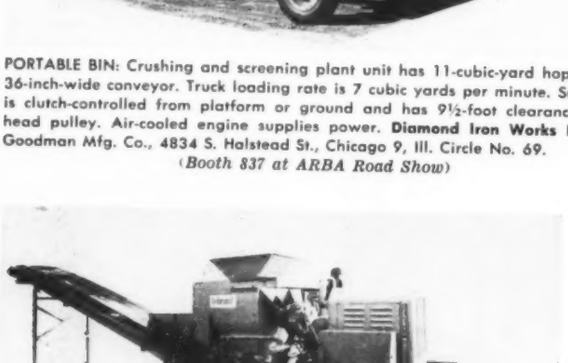


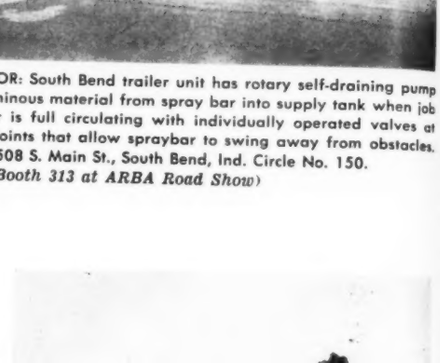
MOST

105A
5/10 YD
with the
UICK-W

PORTABLE BIN: Crushing and screening plant unit has 11-cubic-yard hopper and 36-inch-wide conveyor. Truck loading rate is 7 cubic yards per minute. Surge bin is clutch-controlled from platform or ground and has 9½-foot clearance under head pulley. Air-cooled engine supplies power. **Diamond Iron Works Division,** Goodman Mfg. Co., 4834 S. Halstead St., Chicago 9, Ill. Circle No. 69.
*(Booth 837 at ARBA Road Show)*

BITUMINOUS DISTRIBUTOR: South Bend trailer unit has rotary self-draining pump that sucks back all bituminous material from spray bar into supply tank when job is completed. Spray bar is full circulating with individually operated valves at each spray nozzle and joints that allow spraybar to swing away from obstacles. **Municipal Supply Co.,** 2508 S. Main St., South Bend, Ind. Circle No. 150.
*(Booth 313 at ARBA Road Show)*





TRANSIT CRANE: Car-

# ...CRAWLERS 85 AC & 105 AC

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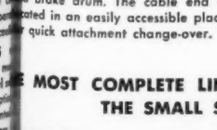
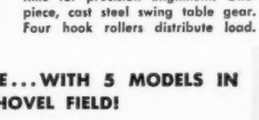
**...E MOST COMPLETE LINE...WITH 5 MODELS IN THE SMALL SHOVEL FIELD!**

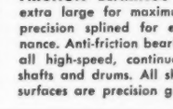


105A & 105AC
5/10 YD., 10½ TONS



125A
6/10 YD., 12½ TONS

*...with the famous money-making line of ...UICK-WAY" attachments for all models.*



***Get these important books . . . free!***

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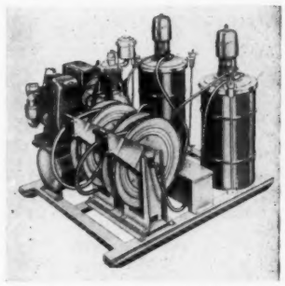
- ☐ The new catalog on the *"QUICK-WAY"* 105A and 105AC Crawler.
- ☐ The new catalog on the *"QUICK-WAY"* 125A.

**"QUICK-WAY" TRUCK SHOVEL CO., Dept. 27**
**2401 East 40th Ave., Denver 5, Colorado, U.S.A.**

*Name*.....*Title*.....
*Company*.....
*Address*.....
*City and State*.....

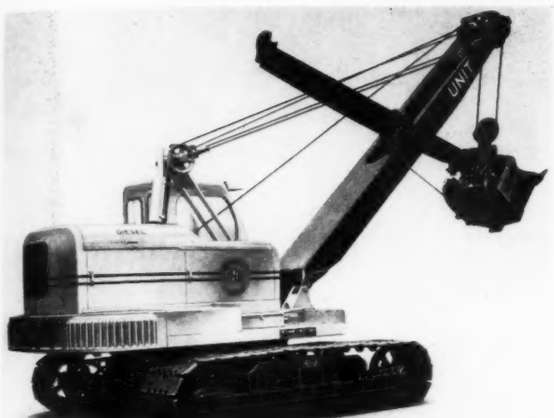
SELF-PRIMING PUMP: Pick-Up Pumper has rated suction lift of 25 feet. Centrifugal-type unit is powered by 2-cycle, 1½ or 2-hp gasoline engine and weighs 27 pounds. Pump features enclosed cooling fan and rubber-cushion mounting. **Construction Machinery Co.**, 447 Vinton St., Waterloo, Iowa. Circle No. 48.
*(Booth 618 at ARBA Road Show)*



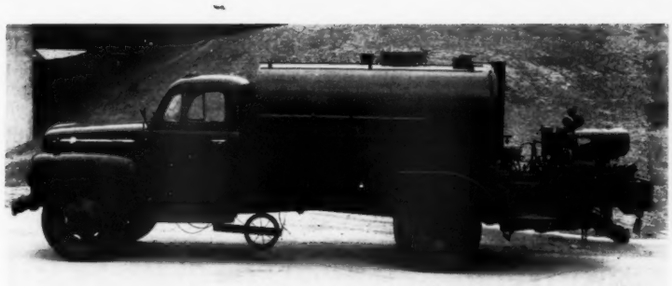
LUBRICATOR: Portable Convoy Luber mounts on steel frame with hardwood skids for field use. Equipment includes two reels of dispensing hose, high and low pressure Fire-Ball pumps, 7.5-cfm compressor, and tool box. Unit can be carried easily in rear of pick-up truck. **Gray Co., Inc.**, 1059A Sibley St., N. E.., Minneapolis 13, Minn. Circle No. 33.

DRAGLINE BUCKET: Model BL is light-duty 3-cubic-yard unit with solid or perforated basket made of Becoloy, a special steel alloy. Solid or two-part Becoloy teeth are available. Two other models handle medium and heavy digging operations. **Bucyrus-Erie Co.**, South Milwaukee, Wis. Circle No. 108.
*(Booth 514 at ARBA Road Show)*

**←For more facts, use coupon or circle No. 435**

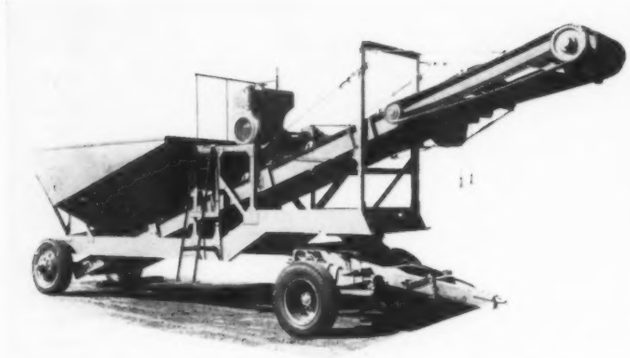



CRAWLER CRANE: Model 1020A is heavy-duty machine that features extra-long crawlers. Unit also has wider axles and shoes, and extra counterweight. As excavator, it takes ¾-cubic-yard bucket. Shovel boom is 19 feet long and dipper stick measures 14 feet. As crane, it handles booms up to 45 feet in length. Boom hoist is enclosed worm-gear drive running in oil bath with spring-loaded safety brake. Independent boom hoist is available as optional equipment. Positive-gear segment-type swing lock engages at any point in turntable arc. **Unit Crane & Shovel Corp.**, 6411 W. Burnham St., Milwaukee 14, Wis. Circle No. 98.
*(Booth 735 at ARBA Road Show)*



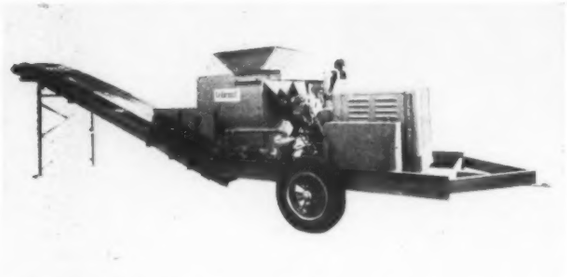
ASPHALT PRESSURE DISTRIBUTOR: Model 424-56W features short pipelines to reduce heat loss. Power is supplied by either liquid or air-cooled engine. Several types of burner assemblies are available, including coilless self-generating type, low-pressure atomizing type, and LPG type. Hydraulic spraybar-lifting mechanism is remote-controlled. Positive locking mechanism secures bar in travel position. Elimination of right-angle drives and location of engine facilitate access to engine and burners for maintenance and repairs. Unit is available in 1,000, 1,250, and 1,500-gallon models with two different spray bar designs. **Standard Steel Works, Inc.**, 16th & Howell, North Kansas City, Mo. Circle No. 96.
*(Booth 302 at ARBA Road Show)*

## *eliminate manual digging*

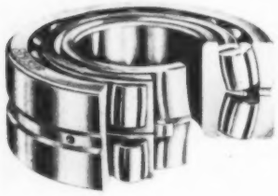


PORTABLE BIN: Crushing and screening plant unit has 11-cubic-yard hopper and 36-inch-wide conveyor. Truck loading rate is 7 cubic yards per minute. Surge bin is clutch-controlled from platform or ground and has 9½-foot clearance under head pulley. Air-cooled engine supplies power. **Diamond Iron Works Division,** Goodman Mfg. Co., 4834 S. Halstead St., Chicago 9, Ill. Circle No. 69.
*(Booth 837 at ARBA Road Show)*

BITUMINOUS DISTRIBUTOR: South Bend trailer unit has rotary self-draining pump that sucks back all bituminous material from spray bar into supply tank when job is completed. Spray bar is full circulating with individually operated valves at each spray nozzle and joints that allow spraybar to swing away from obstacles. **Municipal Supply Co.,** 2508 S. Main St., South Bend, Ind. Circle No. 150.
*(Booth 313 at ARBA Road Show)*



STABILIZED BASE MIXER: Standard unit includes Cedarapids volumetric-proportioning continuous-mix pugmill and aggregate hopper. Delivery conveyor, water meter, and water pump are optional. Capacity is 500 tph with 38-inch pugmill and 200 tph with 24-inch pugmill. **Iowa Mfg. Co.,** 916 N. Cedar St., Cedar Rapids, Iowa. Circle No. 119.
*(Booth 723 at ARBA Road Show)*



ROLLER BEARING: Type C spherical bearing has groove along center of outside ring. Unit is lubricated through holes spaced along groove. Lubricant can therefore reach core of bearing where it does most good. **SKF Industries, Inc.,** P. O. Box 6731, Philadelphia 32, Pa. Circle No. 199.
*(Booth 203 at ARBA Road Show)*

TRANSIT CRANE: Carrier-mounted 30-B is rated at 35 tons. Basic boom is 40 feet long. Unit handles booms up to 100 feet in length with 10, 20, or 30-foot jibs. Boom hoist is independent of all other operations. Boom angle can be changed while machine is swinging or propelling and while load is hoisted or lowered. **Bucyrus-Erie Co.,** South Milwaukee, Wis. Circle No. 107.
*(Booth 514 at ARBA Road Show)*

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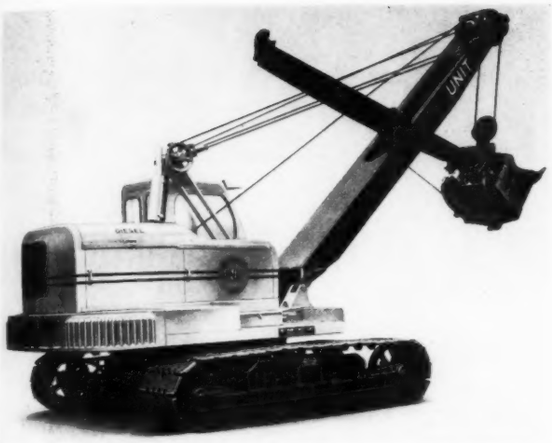
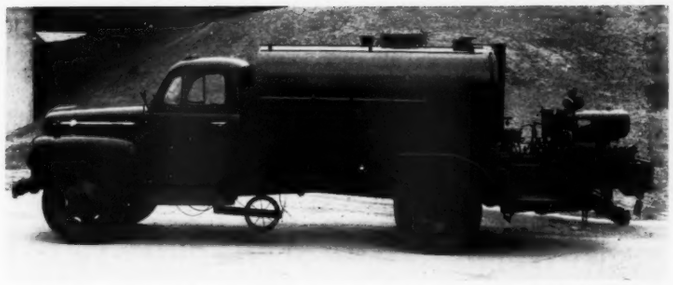


CRAWLER CRANE: Model 1020A is heavy-duty machine that features extra-long crawlers. Unit also has wider axles and shoes, and extra counterweight. As excavator, it takes ¾-cubic-yard bucket. Shovel boom is 19 feet long and dipper stick measures 14 feet. As crane, it handles booms up to 45 feet in length. Boom hoist is enclosed worm-gear drive running in oil bath with spring-loaded safety brake. Independent boom hoist is available as optional equipment. Positive-gear segment-type swing lock engages at any point in turntable arc. **Unit Crane & Shovel Corp.**, 6411 W. Burnham St., Milwaukee 14, Wis. Circle No. 98.

*(Booth 735 at ARBA Road Show)*

TRUCK-MOUNTED CRANE: Model L-1510 lifts 15 tons at 10-foot radius with 30-foot boom. Unit is available with booms up to 75 feet in length. Two-line hoisting, for steel erection, is optional. Hoist equipped for either power or gravity operation. Power supplied by gasoline or diesel-electric set. **Coles Cranes, Inc.**, Box 942-TR, Joliet, Ill. Circle No. 36.



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*(Booth 302 at ARBA Road Show)*


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A revolutionary Fishtail Screw Bit for use with any type of continuous Helix type auger.

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**DIGS 12" TO 120" HOLES AS DEEP AS 200 FEET**

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...but you may see one of the pilot models which has been under test and development since 1952. Before these new "PAYLOADER" tractor-shovels are released for production, they will undergo additional exhaustive testing on many applications, in many sections of the country. Then, and only then, will they be placed into production. When they do become available, you will have thoroughly job-proved machines, perfected in every detail, with the most advanced performance features in the entire industry. We can assure you they will be well worth waiting for.

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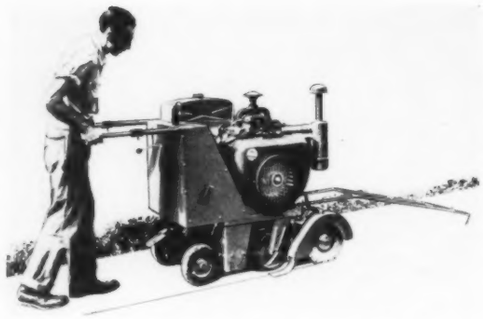
SHOVEL-LOADER: Davis Pit Bull is available with gasoline or diesel engine. Standard equipment includes torque converter with hydraulic-reversing clutch that allows operator to change direction without shifting gears and hydraulic turning and parking brakes. Transmission has five speeds forward and five reverse. Work Bull Division, **Massey-Harris-Ferguson, Inc.**, 1721 Packard Ave., Racine, Wis. Circle No. 100.

*(Booth 810 at ARBA Road Show)*



CONCRETE SAW: Machine available in three models to cut up to 7¾ inches deep. Features include four-point suspension, variable-speed drive, automatic starter, hand-operated clutch, dual blade arbor, and swing-lock blade guard. Power is supplied by Wisconsin 15, 25, or 36-hp engine, depending on model. **Engineered Equipment, Inc.**, P. O. Box 726, Waterloo, Iowa. Circle No. 94.

*(Booth 138 at AED Condex Show)*

VARIABLE-SPEED MOTOR: Types VEV-1-GD (double-reduction) and VEV-1-GM (triple reduction) internally geared Varidrive units are used for low-speed applications requiring variable speeds. **U. S. Electrical Motors, Inc.**, Box 2058, Terminal Annex, Los Angeles 54, Calif. Circle No. 123.

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*2-Wheel Model RMT Maintenance Unit with front mounted heaters and rear mounted pump and engine is available in 400, 500 or 600 gallon sizes.*

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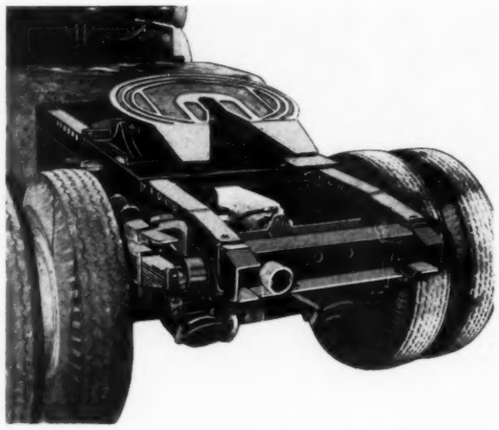

FIFTH WHEEL: Unit is mounted on De Lay movable subframe fabricated of ¼-inch steel plate. Subframe attaches to truck chassis. Four 1¼-inch steel pins lock movable mount in any desired position in 3-inch increments. Movable features allow better weight distribution, avoid overloaded axles, and provide ample clearance between truck tires and trailer landing gear. To move fifth wheel mount, pins are pulled out, trailer brakes are locked, and truck is driven forward or back. Company also makes De Lay trailer load equalizer, which allows tandem axle to slide forward or back to balance axle loads. Principle of operation is the same as for fifth wheel. **Binkley Mfg. Co.**, Warrentown, Mo. Circle No. 82.

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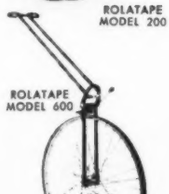


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**ROLATAPE, INC.**
Factory: 1741 Fourteenth Street, Santa Monica, California

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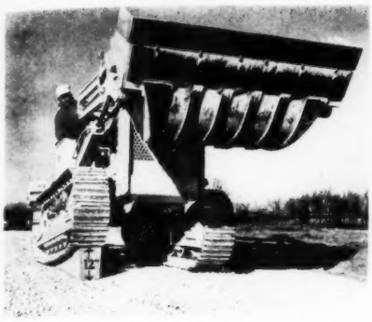
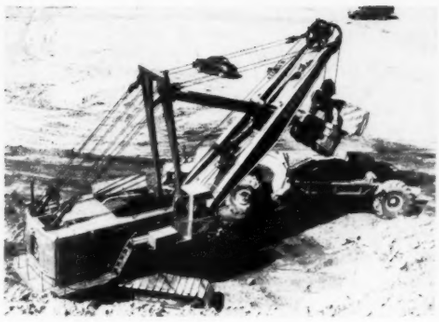
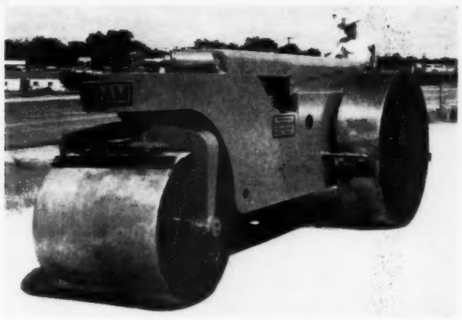


CRAWLER LOADER: Redesigned TerraTrac has transmission that allows independent speed and direction control of each track. Torsion-bar track suspension permits raising of one track one foot while bucket cutting edge remains level. **American Tractor Corp.**, 800 Fort Wayne St., Churubusco, Ind. Circle No. 197.

*(Booth 827 at ARBA Road Show)*



EXCAVATOR: Model 4500 takes 5½-cubic-yard shovel. As crane, machine has 100-ton capacity and uses 4 to 6-cubic-yard clamshell or dragline bucket on 120 or 140-foot boom. Power is supplied by single diesel or single electric motor. Optional special boom hoist rigging speeds raising and lowering of boom. **Manitowoc Engineering Corp.**, 16th and River Sts., Manitowoc, Wis. Circle No. 148.



ROAD ROLLER: Twelve-ton Ingram compactor features Reverse-O-Matic drive that permits non-stop power-shifted reversing with one lever controlling both speed and direction. Reverse-O-Matic unit is sealed in oil and requires no maintenance or adjustment at any time. No clutches ever need replacing. **Acme Iron Works**, P. O. Box 2020, San Antonio, Texas. Circle No. 90.

*(Booth 610 at ARBA Road Show)*

ASPHALT MIXER: McConnaughay No. 25 produces up to 20 tph hot mix and up to 45 tph cold mix. Unit features two-compartment aggregate bin with reciprocating feeder, positive displacement asphalt pump to supply asphalt, three-compartment three-shaft pugmill mixer and heating unit with total 24-foot travel, 48 mixing paddles, and 12 burners. Mixer may be driven by gasoline or diesel engine or by electric motor. It works equally as well with cutbacks and emulsions as with regular asphalt cements. Aggregate loading is at tractor height and bucket-type elevator discharges directly into trucks. Heavy-duty anti-friction bearings are used throughout. **Asphalt Equipment Co., Inc.**, 3314 Cherry Lane, Fort Wayne, Ind. Circle No. 106.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For more facts, use Reader-Reply Card opposite page 18 and circle No. 443

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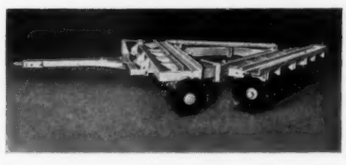

Rome Disk Plowing Harrows

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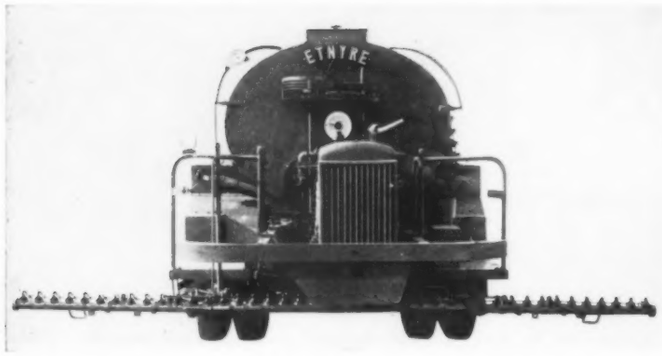
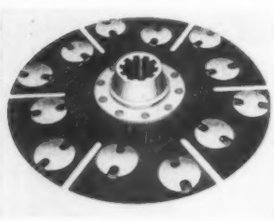



**SPRAYBAR:** Circulating turn-up bar inverts 90 degrees from spraying position for complete drainage. Air-operated unit has valve for each nozzle, allowing independent nozzle operation over entire length of bar. **E. D. Etnyre & Co.**, Oregon, Ill. Circle No. 99.
*(Booth 710 at ARBA Road Show)*

**HEAVY-DUTY TIRE:** Vanderbilt Multi-Lug designed for both on and off-highway service. Available in DuPont Super Cordura or 100 per cent nylon casing. **The Tire Mart, Inc.**, 419 Fourth Ave., New York 16, N. Y. Circle No. 212.

**PHOTOCOPYER:** Dri-Stat 200 will handle any copying job up to 9 inches wide. Machine copies colored inks and pencilled notations, as well as charts, drawings, and halftones. Unit needs less space than standard portable typewriter. Automatic feed device is optional. **Peerless Photo Products, Inc.**, Shoreham, Long Island, N. Y. Circle No. 224.

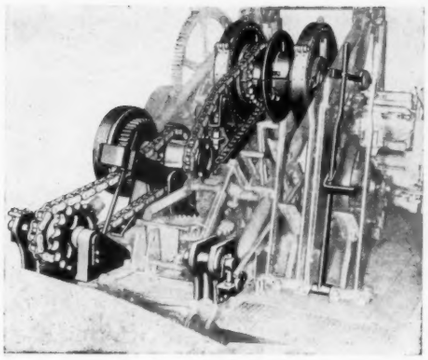
**OIL FILTER:** Spin-In model is improved version of PC-15 Full-Flow unit for Ford vehicles. It fits late-model Fords by means of special adapter kit. Twist of wrist removes disposable cartridge; new one spins on in few seconds. Filter eliminates housing, cover, and cover bolts of old-type units. **Wix Corp.**, Gastonia, N. C. Circle No. 204.



**CLUTCH PLATE:** Unit fitted with multiple buttons faced with Velvet-Touch ceramic instead of full-ring facings. Buttons not encased in steel cups; only ceramic friction material contacts pressure plate and flywheel. **S. K. Wellman Co.**, 200 Egbert Road, Bedford, Ohio. Circle No. 88.
*(Booth 334 at ARBA Road Show)*

Packy Says
every day is a
Road Show Day
for ROGERS
TRAILERS
PACKY
Check and you'll choose a ROGERS
See them Illustrated and Described in Detail . . .
Today Rogers is doubtless the best known and most respected name in the low bed trailer field. Units are being operated throughout the world by public utilities; state, county and city highway departments; heavy movers, riggers, contractors and military organizations.
Through long, specialized effort Rogers engineers have developed new designs that are now in common use and originated valuable Patented features that are available on Rogers trailers exclusively.
ROGERS BROS. CORP. Albion,

EXCAVATOR: Buckets for Gradall are available in widths of from 15 to 72 inches. Controls for upper structure and for travel are located in same cab. **Gradall Division,** Warner & Swasey Co., 5701 Carnegie Ave., Cleveland, Ohio. Circle No. 198.
*(Booth 815 at ARBA Road Show)*



ROLLER CHAIN: Use of chain recommended to eliminate long train of power-reducing gears on power takeoff drives, and for crowding, propelling, and retracting on ditchers and excavators. **Diamond Chain Co., Inc.,** 402 Kentucky Ave., Indianapolis, Ind. Circle No. 225.


## *See the Continual SHOW of ROGERS TRAILERS on Heavy HAULING OPERATIONS on the ROADS EVERYWHERE*

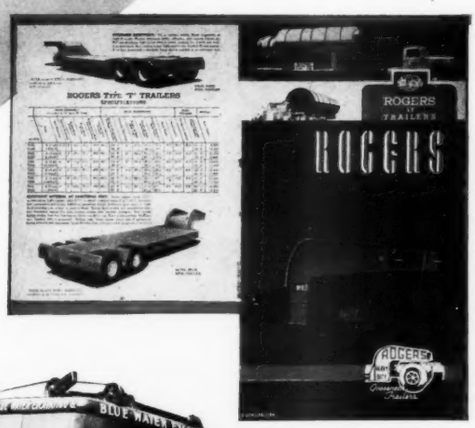
You'll see them on short hauls in cities and towns and on the long, between-city hauls moving at a rapid rate. There's no time lost in loading, unloading or hauling when a Rogers trailer carries the load.

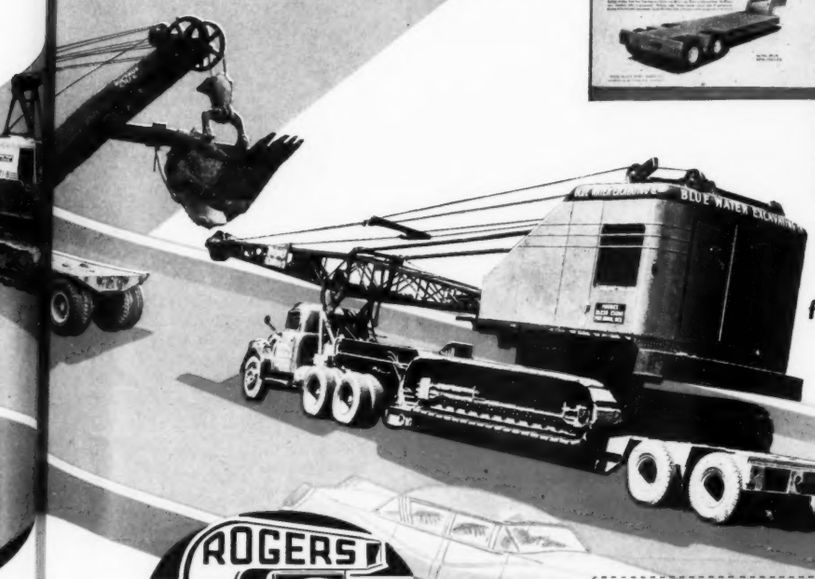
Heavy haulers and experienced riggers everywhere know they can depend on Rogers Trailers for LOADABILITY, HAULABILITY and CONTROLABILITY.

That's why the big majority of them have wisely standardized on the Rogers Line of Heavy Duty Trailers.

***Learn Why they're FIRST CHOICE for the HEAVY HAUL***

*Read the Rogers Catalog*




***Contact Your Distributor for the ROGERS CATALOG, or MAIL THE COUPON BELOW.***

ROGERS HEAVY DUTY Gooseneck Trailers

EXPORT OFFICE: 50 CHURCH ST., NEW YORK 7, N. Y., U. S. A.
CABLE ADDRESS BROSITES

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ROGERS BROS. CORP.
Orchard Street, Albion, Pa.

*Name* _____
*Company* _____
*Address* _____
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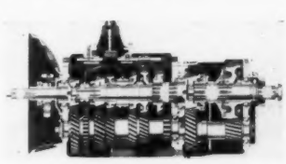
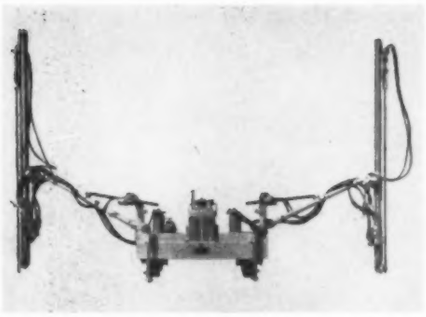
CRAWLER-CRANE: Model 795 takes booms up to 120 feet long. All controls are air-operated. Machinery deck is welded into single unit for permanent alignment of all gear and shaft assemblies. With 80-foot boom at 30-degree angle, dragline has dumping reach of 76 feet and dumping height of 33 feet. **American Hoist & Derrick Co.,** 63 S. Robert St., St. Paul 1, Minn. Circle No. 200.
*(Booth 505 at ARBA Road Show)*

ASPHALT PIPELINE TRACING: Inner tracing keeps asphalt at correct temperatures from storage tank to weighing bucket or metering device without any danger of coking. **Hynes Electric Heating Division,** Turbine Equipment Co., Mountainside, N. J. Circle No. 242.



TRANSMISSION: Roadranger R-96 consists of a 5-speed transmission with closely spaced ratios and a 2-speed auxiliary with wider-spaced ratios, giving combination of 10 speeds forward and two reverse. **Fuller Mfg. Co.,** Kalamazoo, Mich. Circle No. 202.
*(Booth 221 at ARBA Road Show)*


←For more facts, use coupon or circle No. 445



DUAL DRILL: Self-propelled Model T 286 permits highly variable drilling patterns. Rig uses DR40 feed, which has 10-foot travel and 8-foot steel change, and 3½ or 4-inch drifter. Drill is available with one or two Le Roi-Cleveland air feeds mounted on 28-hp crawler tractor. **Le Roi Division,** Westinghouse Air Brake Co., 3716 W. Wisconsin Ave., Milwaukee, Wis. Circle No. 26.

*(Booths 53, 54, and 55 at AED Condex Show)*

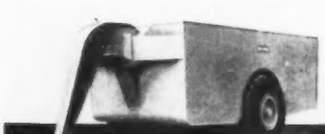
WET-BATCH DUMP BODY: Dumpcrete model for tandem-axle trucks carries 6 cubic yards; model for single-axle trucks hauls 4 cubic yards. Rig carries wet-mix concrete from mixing plant to pouring site without agitation. Dumping angle is 90 degrees; chute rotates through 180-degree arc. By removing chute and gate, rig becomes all-purpose body. **Maxon Construction Co.,** 131 N. Ludlow St., Dayton, Ohio. Circle No. 27.

HAMMER ATTACHMENT: Portable DGH-100 is differential-acting pile hammer that operates by compressed air or steam. Rig weighs 786 pounds and is just over 4 feet long, small and light enough to be carried in Jeep or pick-up truck. Rated striking energy is 386 foot-pounds. **Vulcan Iron Works, Inc.,** 327 N. Bell Ave., Chicago, Ill. Circle No. 30.

*(Booth 65 at AED Condex Show)*


BIG Southwest Compaction Equipment for all types of tractors

BIG Southwest Compaction Rollers



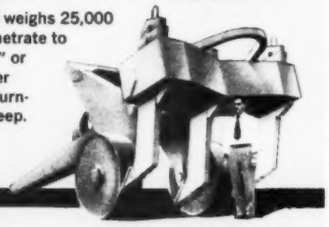
BIGNESS MEANS SPEED when earthmoving and compaction is the problem. These big, multiple-box rollers are made in five sizes ranging in weight capacity from 10 to 100 tons. **Single Box Compaction Rollers** are also available in two sizes with weight capacities up to 100 tons.

BIG Sheepsfoot Rollers

RANGING FROM 5 TO 20 TONS in weight capacity, there are six models of Southwest Rollers featuring full oscillating double drums and two-piece feet with replaceable tips.

BIG Southwest Rippers

IT'S A GIANT that weighs 25,000 lbs. Is built to penetrate to depths of 36", 42" or 48". Special center standard can be furnished to go 60" deep.

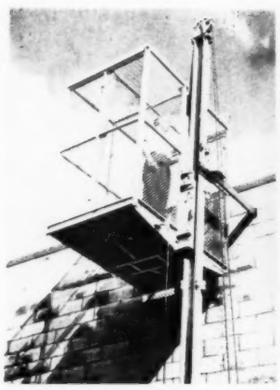


BIG Southwest Sprinkler Tanks

5000 TO 7500 GALLONS is the capacity of these big semi-trailer type Sprinkler Tanks. Have front, rear and under-tank spray bars. Get the facts about these big units; write for bulletins today!

Southwest Welding & MANUFACTURING CO.
CONSTRUCTION MACHINERY DIVISION
ALHAMBRA, CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 446

PERSONNEL ELEVATOR: Demountable passenger carrier operates on vertical monorail and has capacity of 2,000 pounds. Governor will automatically stop car if it exceeds safe speed. Automatic limit switch prevents operation unless both gates are closed and latched. **Hawkeye Products Corp.,** 248 Lincoln Ave., Syracuse 4, N. Y. Circle No. 206.

HYDRAULIC PUMP: Gasoline-engine-driven unit delivers 19½ cubic inches of oil for 500 rpm and develops maximum pressure of 10,000 (intermittent) and 6,000 (continuous) psi. **Owatonna Tool Co.,** 381 Cedar St., Owatonna, Minn. Circle No. 209.

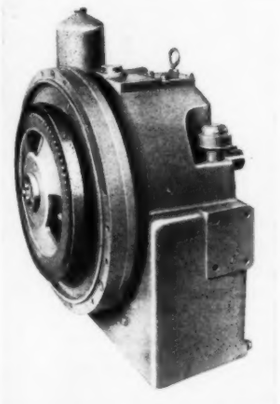
PREHEATER: Zero-Start external tank-type unit connects to engine drain block. It operates off 115-volt ac or dc current supply. **Phillips Mfg. Co., Inc.,** 2816 Alrich Ave. S., Minneapolis 8, Minn. Circle No. 208.

TRACTOR SHOVEL: Michigan Model 375A lifts 30,000 pounds while stationary and carries 15,000 pounds moving at 4 mph. Shovel's capacity is 6 cubic yards. Torque converter and power-shift transmission are standard equipment. Top speed is 28 mph. **Clark Equipment Co.**, Construction Machinery Division, Pipestone Road, Benton Harbor, Mich. Circle No. 40.
*(Booths 823, 829, and 831 at ARBA Road Show)*

END-DUMP TRUCK: Reportedly able to make 4½ complete trips per hour over 1,200-foot haul route, Model 65 Payhauler is 18-ton-capacity rig. Power is supplied by 250-hp diesel engine. Dumping is by means of hydraulic double-acting hoists at angle of 65 degrees. **International Harvester Co.**, 180 N. Michigan Ave., Chicago 1, Ill. Circle No. 43.
*(Booths 711, and 726 at ARBA Road Show)*

TANDEM ROLLER: Retractable wheel attachment, hydraulically operated, makes 3 to 5-ton unit highly portable. Controls for wheels are located on side of roller. Unit has water-cooled 41-hp engine and torque converter. Adjustable guide roll assembly eliminates road scuff caused by looseness. **Huber-Warco Co.**, 202 N. Greenwood St., Marion, Ohio. Circle No. 31.
*(Booth 714 at ARBA Road Show)*

LIFT TRUCK: Skytrak Model 445 will hydraulically raise 3,000 pounds 20 feet in 17 seconds. Four-inch-wide forks have continuous span adjustment on 2-inch centers. Ampli-Torc transmission gives two working ranges in each gear. Power is supplied by 53-hp engine. **West Brick Buggy Corp.**, 4310 Mayfield Road, Cleveland 21, Ohio. Circle No. 95.
*(Booths 153, 154 at AED Condex Show)*

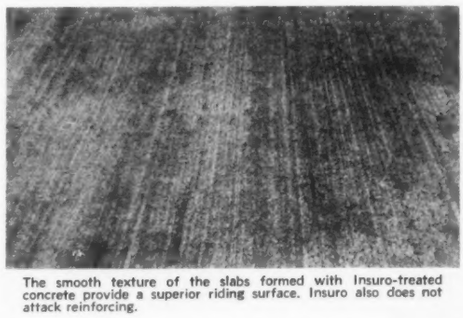


TORQUE CONVERTER: Single-stage 1500 Series unit is designed for shovels, front-end loaders, and lift trucks with engine producing from 30 horsepower at 1,100 rpm to 207 horsepower at 2,500 rpm. Impellers are available for specific torque ratings of 164, 200, 240, 285, and 300 pound-feet. **Twin Disc Clutch Co.**, Racine, Wis. Circle No. 74.
*(Booth 413 at ARBA Road Show)*


# *Laboratory Tests Prove INSURO*

Early permanent strength is evident in this paving job at East Providence, R. I., where 8-inch slabs took traffic in 48 hours.

Curing starts early on another East Providence stretch, because the smooth fatty mix provided by Insuro makes for excellent workability.



The smooth texture of the slabs formed with Insuro-treated concrete provide a superior riding surface. Insuro also does not attack reinforcing.

Work on the roadway is completed on Thursday afternoon. By Saturday morning, traffic was using the road. Insuro will allow for less curing time which makes for greater savings.

## SIX-WAY
**Emulsion**
## LIQUID CHEMICAL PORTLAND CEMENT INTENSIFIER

**ACCELERATES SET**
. . . so that roads can take traffic sooner; concrete walls, foundations, and piers can be poured one day and stripped the following morning.

**GIVES HIGH EARLY STRENGTH**
. . . as is shown in tests made by Skinner & Sherman, Inc., Boston, Mass., These give psi strengths of 1,592 for 2 days; 2,901 for 7 days; 4,068 for 28 days; and 5,467 for 6 months.

**REPELS WATER**
. . . by filling pores in concrete with insoluble material to assure lifetime repellancy for tunnels, dams, foundations, and sea and retaining walls. Shelling, spalling, crevassing are eliminated.

**PREVENTS FREEZING AS LOW AS 40° BELOW 0°**
. . . by lowering the freezing point of the mixing liquid. In tests by Herman G. Protze, Boston, Mass., which indicated extraordinarily good results, Insuro-treated concrete developed psi strength of 2,610 in 6 days at 70 degrees; 2,020 in 2 days at 40 degrees. The 6-day strength of the Insuro concrete (stored dry, 2 days at 40° F plus 4 days at 0° F) is *28% stronger* than the companion plain mixture (at the same cement factor) stored for 6 days at standard 70° F and 100% RH moisture.

**ACTS AS A HARDENER**
. . . giving trowel-finish concrete a hard, glossy surface that resists abrasion and destructive acids and is easy to keep dust-free.

**PRODUCES A GOOD BOND**
. . . since it reduces the porosity and contraction of cement. The dense mortar permits fast repair work on floors, roadways, and even in tunnels — against a hydrostatic head of water.

EARLY PERMANENT STRENGTH
WATER-REPELLENT

HARDENER
BONDER
ACCELERATER
ANTI-FREEZE

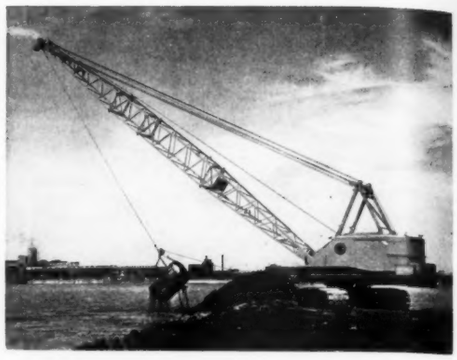
SINCE 1938

Registered in United States & Canada

## Insuro Chemical Co., Inc.
**Box 249, West Upton, Mass.**

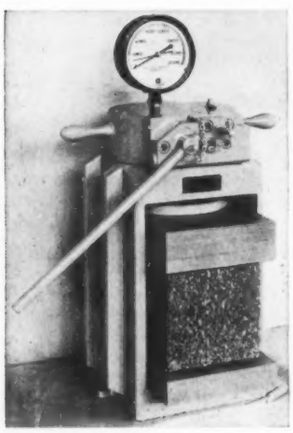
For more facts, use Reader-Reply Card opposite page 18 and circle No. 447

WELDER: Line of modified constant-voltage units has adjustable slope control to give softer arc and provide stable spray-type deposit when properly adjusted for various alloys. **Harnischfeger Corp.**, Welding Division, 4400 W. National Ave., Milwaukee, Wis. Circle No. 276.
*(Booths 510 and 609 at ARBA Road Show)*

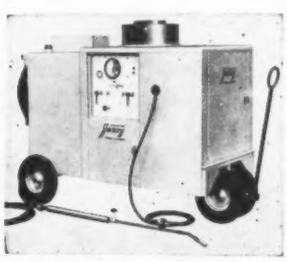


EXCAVATOR: Model 1205 has lifting capacity of 95 tons at 75 per cent rating. As shovel it takes a 30-foot boom with 22-foot dipper stick and 3-cubic-yard bucket. Sixty-foot alloy-steel crane boom extends to 180 feet and can take additional 30-foot jib boom. **Koehring Co.**, 3026 W. Concordia Ave., Milwaukee 16, Wis. Circle No. 248.
*(Booths 512 and 725 at ARBA Road Show)*

HYDRAULIC PUMP: Direct-drive Ateco pump for Ateco tractor-mounted rock ripper maintains constant hydraulic control pressure. Pump mounts at engine power takeoff, just ahead of clutch and transmission assembly. **American Tractor Equipment Corp.**, 9131 San Leandro Blvd., Oakland 3, Calif. Circle No. 289.



COMPRESSION TESTER: Portable device tests both concrete blocks and cylinders. Unit weighs 285 pounds and has capacity of 200,000 pounds compression load. **Tinius Olsen Testing Machine Co.**, 5129 Easton Road, Willow Grove, Pa. Circle No. 283.



HIGH-PRESSURE CLEANER: Series 4000 Hypressure Jenny gives wide choice of cleaning action: from 400 gph of clear cold water at 450 pounds pressure to mixture of steam, water, and cleaning compound at 325 degrees F. **Homestead Valve Mfg. Co.**, P. O. Box 550, Coraopolis, Pa. Circle No. 282.




**All over Texas the TD-14's get jobs, and *produce!***

**Over 225 International TD- have whipped toug bs for Brown nd**

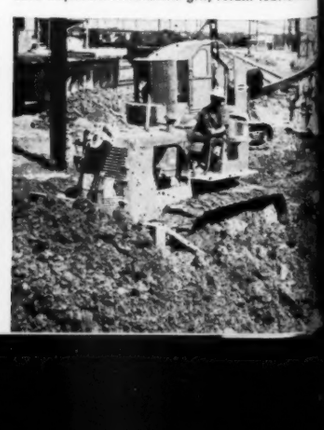
**BUILDING FIRE WALLS IN LIBERTY.** One of ten TD-14 tractors, recently purchased by Brown and Root, builds roads, flood dikes, and clears land for new well sites. New TD-14 provides genuine "in-seat" starting!

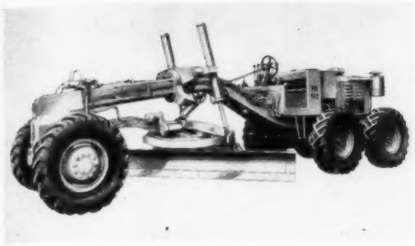
**SPREADING AND COMPACTING IN HOUSTON.** TD-14 with both ends busy, spreads fill and compacts it at the same time with a sheepsfoot roller. Construction is for preparation of new Juvenile Detention Home site for Harris County.

**SPREADING FILL IN HOUSTON.** This TD-14 levels land on 360-acre naturalistic park, on south shore of Lake Houston. The new bonus-powered TD-14 has new bridge-strong box-beam track frames—for big-capacity, tough-material dozing!

**BACKFILLING TRENCH IN TEXAS CITY.** A 74-mile long, 8-inch pipeline from Hull to Texas City undergoes its last operation with another TD-14. Cerametallic engine clutch facings reduce operator effort and prolong clutch life in fast "shuttle-dozing" like this!

**REPLACING PIPELINE IN HOUSTON.** Stationed near home, this TD-14 joins a trench-hoe to move muck for pipeline replacement in railroad yard, at Sheffield Steel Company. In muck, mud, or water, new track roller seals save inspections...exclude grit, retain lubricant.





MOTOR GRADER: Speedmatic Model PM-612 is six-wheel-drive unit with constant-mesh power transmission, torque converter, and hydraulic sideshift moldboard. **Pettibone New York Corp.**, 1212 E. Dominick St., Rome, N. Y. Circle No. 279.
*(Booth 813 at ARBA Road Show)*

REAR-DUMP TRUCK: Model AP-15 hauls loads of 15 tons at speeds up to 39 mph. Off-highway unit features planetary-gear-drive rear axle with reduction taking place at outer ends of axle. **Autocar Division**, White Motor Co., Exton, Pa. Circle No. 280.
*(Booth 811 at ARBA Road Show)*

BUMP CUTTER: Self-propelled Concut is used for leveling concrete and asphalt surfaces, for erasing paint markings, and for removing accumulated old rubber from runways. Cutting head is powered by 36-hp engine. **Concrete Sawing Equipment, Inc.**, 331 N. Santa Anita Ave., Arcadia, Calif. Circle No. 281.


al TD-14's
bs everywhere
nd Root, Inc.*
associate Companies

**BROWN AND ROOT RADIO-DISPATCHED TRUCK** with International TD-14 gets "go-ahead" from dispatcher. Because of modern methods, Brown and Root TD-14's can be on the job anywhere in East Texas in just a few hours. No special haulage permit needed to transport the easy-to-truck TD-14!

## International TD-14's give big contractor "middleweight" mobility and heavy work *power-punch*... to profitably finish jobs fast!

Internationally-famous contractor, Brown and Root, Inc., take the tough jobs wherever they are, from Guam to Guatemala—from Alaska to Calcutta. On work requiring 70-80 dbhp, they have purchased more than 225 International TD-14 crawlers to get unmatched job-to-job mobility and big capacity.

**Another big reason for this choice,** the TD-14 starts seconds-fast in all weather with famous International gasoline-conversion diesel starting. It's on the job fast without profit-gobbling delays!

**Another big reason,** new built-in operating ease, control tower visibility, hydraulic booster steering, clean geared-for-action deck, adjustable deep-cushioned seat. ALL add job-getting efficiency and cost-cutting capacity!

**Other reasons:** low operating cost; servicing ease! The heat-defying new Cerametallic engine clutch facings increase life, save adjustments! Famous micrometric fuel pump precision saves fuel, postpones overhauls. New track-roller seals hold greasing to 500-hr. intervals!

**Reasons like these are why** contractors everyhere are standardizing on bonus-powered International crawlers! Try one on your next job. Your International Construction Equipment Distributor will gladly demonstrate!

**BREAKING DOWN RICE LEVEES IN ANAHUAC.** Not all of Brown and Root Corporation's TD-14's work on industrial projects. This one tears down rice levees on a special assignment when oil field or other work is slack.

INTERNATIONAL HARVESTER

# INTERNATIONAL® Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

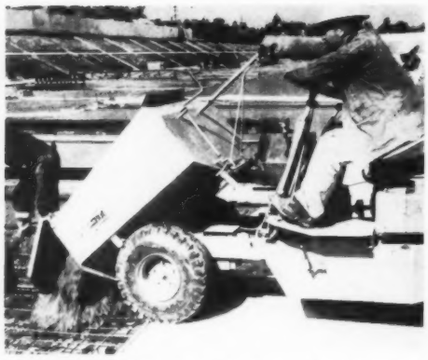
A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Side Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks

JOINT SEALER: CP-300 applies cold joint-sealing compounds to newly sawed control joints in concrete pavements. Unit features air controls, accumulator that provides smooth flow of compound through nozzle, and spreader shoe that scrapes off excess material above grade. Machine is also recommended for calking, waterproofing, applying protective coatings, and heavy lubricating. **Clipper Mfg. Co.**, Suite 635, 2800 Warwick, Kansas City 8, Mo. Circle No. 251.
*(Booth 223 at ARBA Road Show)*

DRILL BIT: Tapered-socket carbide-insert rock bit is recommended for air-leg drilling and light stoping. Four-point crosswing is said to give longer life and greater footages between sharpenings. Bits can be removed from steel and discarded without throwing steel away. Bits are available for ⅞ hex and ⅞ quarter-octagon drill steels. **The Timken Roller Bearing Co.**, 1835 Dueber Ave., S. W., Canton 6, Ohio. Circle No. 278.
*(Booth 816 at ARBA Road Show)*

←For more facts, circle No. 448

END-DUMP TRUCK: Movall utilizes "scraper-in-reverse" ejection unloading, permitting use of rig with sticky materials. Ejection system permits accurate spotting of loads. Unit is available in sizes of from 12 to 26½ cubic yards and fits all rubber-tired tractors. **C&D Division,** Yuba Mfg. Co., 701 East H St., Benicia, Calif. Circle No. 312.



MATERIALS BUGGY: Model M30 now has improved throttle linkage and hydraulic torque-converter drive. It is available with 18-cubic-foot, 1½-ton bulk bed. Release at operator's seat permits bed to dump forward 35 degrees. For partial discharge, lever in front of bed raises sliding endgate. **Prime-Mover Co.,** Muscatine, Iowa. Circle No. 117.

ROAD STABILIZER: Model 54-S Roadmixer is self-propelled and has tandem drive. Mixing and traveling power is supplied by 190-hp diesel engine. Speeds exceed 28 fpm. In soil cement, capacity is up to 550 tph. **Pettibone Wood Mfg. Co.,** 6900 Tujunga Ave., North Hollywood, Calif. Circle No. 145.

*(Booth 813 at ARBA Road Show)*


# KEEP THEM ROLLING

...IN MUD SNOW OR SAND

WITH *all-weather*

# TRUCK TRACKS

Beat the *Mud* and *Snow* and *Sand*... mount TRUCK TRACKS on your rolling equipment. TRUCK TRACKS can eliminate seasonal shutdowns on the job by adding *tractor performance* to your trucks.

Drivers mount TRUCK TRACKS in 10 minutes time; remove them in less. Adjustments are simple and easy to make. Nothing to break, bend or loosen...maintenance is negligible.

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**VERSATILE**

Super traction for *single* as well as *tandem axle trucks.* SIZES AVAILABLE FOR ALL HEAVY-DUTY SINGLE AND DUAL TIRES.

The unusually low price of TRUCK TRACKS puts them within the reach of every truck owner... *If you're bogged down, contact your local dealer or call, wire or write us!*

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...DEALER INQUIRIES INVITED

**TRUCK TRACKS NOW USED ON...**

Quick-Way Shovels and Cranes • Gradalls • P & H Cranes • Lorain Moto-Cranes • Schield-Bantam Shovels and Cranes • Northwest Cranes • Hyster Fork Lifts • Unit Crane • Mandt Swing Loader • Wayne Cranes • Byers Shovels and Cranes • Little Giant Shovels and Cranes • Drilling Rigs, Tractors, and Many Other Truck-Mounted Shovels and Cranes.

**P&G SUPPLY CO.**
2262 North Albina
PORTLAND 12, OREGON

P&G SUPPLY CO., 2262 N. Albina, Portland 12, Oregon Dept. 2A
Gentlemen: Please rush complete TRUCK TRACK details and prices for:

SINGLE AXLE: ☐ Single Tire____x____ (Size) ☐ Dual Tire____x____ (Size)

TANDEM AXLE: ☐ Single Tire____x____ ____(inches) Center-to-Center Axle Spacing

☐ Dual Tires ____x____ ____(inches) Center-to-Center Axle Spacing

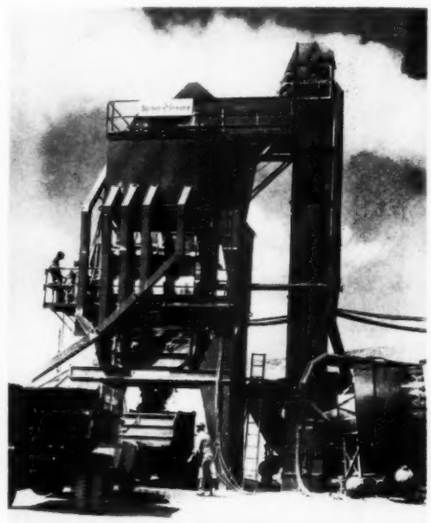
Name____

Address____

City____ Zone____ State____

My Local Equipment Dealer is:____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 449

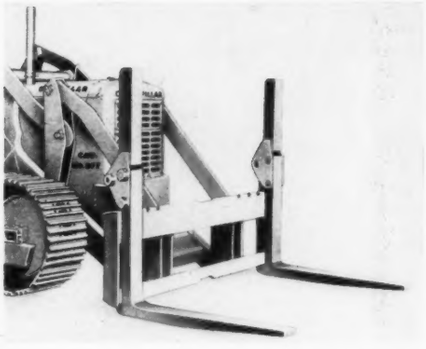
ASPHALT PLANT: BatchO-matic Model 896 has capacity of 6,000 pounds. Other models available with 4,000 and 2,000-pound capacities. Features include simultaneous weighing of aggregates and bitumen, instant changeover from fully automatic to manual operation, Dyna-Mix pugmill, and instant inspection of aggregate gradation and weight. Plant employs simple electric on-off switches and timers, and does not incorporate any electronic equipment. Complete range of dryers, dust collectors, elevators, and aggregate cold-feed systems are available. Peak production rate on automatic operation is 230 tph. **Barber-Greene Co.,** 400 N. Highland Ave., Aurora, Ill. Circle No. 115.

*(Booth 722 at ARBA Road Show)*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 450

CONCRETE TESTER: Machine automatically performs thawing and freezing tests on concrete and aggregates according to ASTM designations. It can accommodate up to 60 concrete specimens. **Conrad, Inc.**, 141 Jefferson St., Holland, Mich. Circle No. 140.

BITUMINOUS PAVER: Vibromatic machine features vibrating screed that meters out and pre-compacts material required for selected mat thickness. Oscillating action fills voids across entire mat. **Pioneer Engineering Works, Inc.**, 3200 Como Ave., Minneapolis, Minn. Circle No. 92.
*(Booth 729 at ARBA Road Show)*



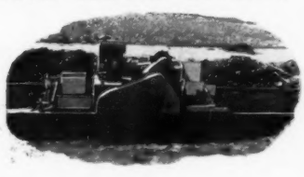
FORK ATTACHMENT: Unit fits Caterpillar No. 977 Traxcavator and is used for handling poles, pipe, and palletized loads. Attachment includes carriage that is attached to lift and tilt arms in place of bucket. **Caterpillar Tractor Corp.**, Peoria, Ill. Circle No. 76.
*(Booths 701 and 720 at ARBA Road Show)*

POWER SHOVEL: Lorain 56 is air-controlled and takes 1¼-cubic-yard bucket. It is convertible to shovel crane, clamshell, dragline, and hoe service. Shovel boom is 21 feet long and takes 17-foot dipper stick. Hoe boom is 23 feet long and takes 7-foot dipper stick. Counterweight is detachable to facilitate over-the-highway travel. **Thew Shovel Co.**, 28th & Fulton Road, Lorain, Ohio. Circle. No. 138.
*(Booth 503 at ARBA Road Show)*


## *New* 1957 DOTMAR Curb & Gutter Paver

### TO BE UNVEILED AT THE "ROAD SHOW"!

**IN 1947**
we introduced the first mechanical curb and gutter paver, filling a long-felt need. Curb and gutter paved up to 10' per minute. No face forms required. Later extensions were made available for use in sidewalk paving.



**IN 1953**
we introduced an improved model with Mechanical Tamping Attachment, assuring a sounder concrete structure.

**NOW, IN 1957**
we introduce the last word in design—new features such as reverse gear—machine can go backward or forward—built-in compressor with concrete vibrator that can be used anywhere on machine, plus other features. See it for sure!

**Dotmar INDUSTRIES Inc.**
519 HANSELMAN BUILDING KALAMAZOO, MICHIGAN

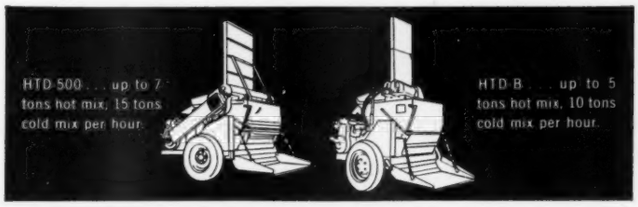
*See! NEW Dotmar Rotary Brush Cutter*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 451

## *LOW COST PRODUCTION*
### *OF BITUMINOUS PAVING MIXTURES*

McConnaughay Mixers are setting records for hot or cold patching and small resurfacing jobs *in any season!*

WORKING right on location, McConnaughay HTD Mixers are setting remarkable records for low cost production of bituminous paving mixtures... used for hot or cold patching and small resurfacing jobs in any season. Illustrated above is a Model HTD-500 at work on a street patching job. It provides the exact amount of material needed for fast, easy work with a small crew. Important, too, McConnaughay HTD models effectively remove both moisture and solvents from bituminous mixtures... patches and resurfaced areas set up hard as soon as the applied mixture cools. Write, wire, or 'phone for details and specifications today.




**K. E. McCONNAUGHAY**
LAFAYETTE, INDIANA

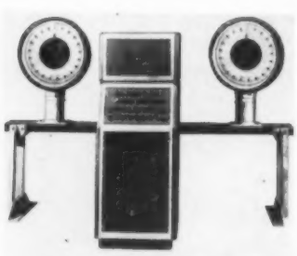
National distributors: Asphalt Equipment Co., Inc., 3314 Cherry Lane, Fort Wayne, Indiana

For more facts, use Reader-Reply Card opposite page 18 and circle No. 452

DITCHING MACHINE: Said to be largest in world, Gar Wood-Buckeye 330 excavates 660 cubic yards per hour, cutting trench 11¼ feet deep and 5 1/3 feet wide. One-man-operated machine rides on 30-inch crawler tracks in rear and 30-inch pneumatic tires up front. Digging wheel has 15 speeds. Power is supplied by 220-hp Cat diesel engine, through torque converter, to pair of Allison Torquematic transmissions. **Gar Wood Industries, Inc.**, 36253 Michigan Ave., Wayne, Mich. Circle No. 246.
*(Booth 700 at ARBA Road Show)*

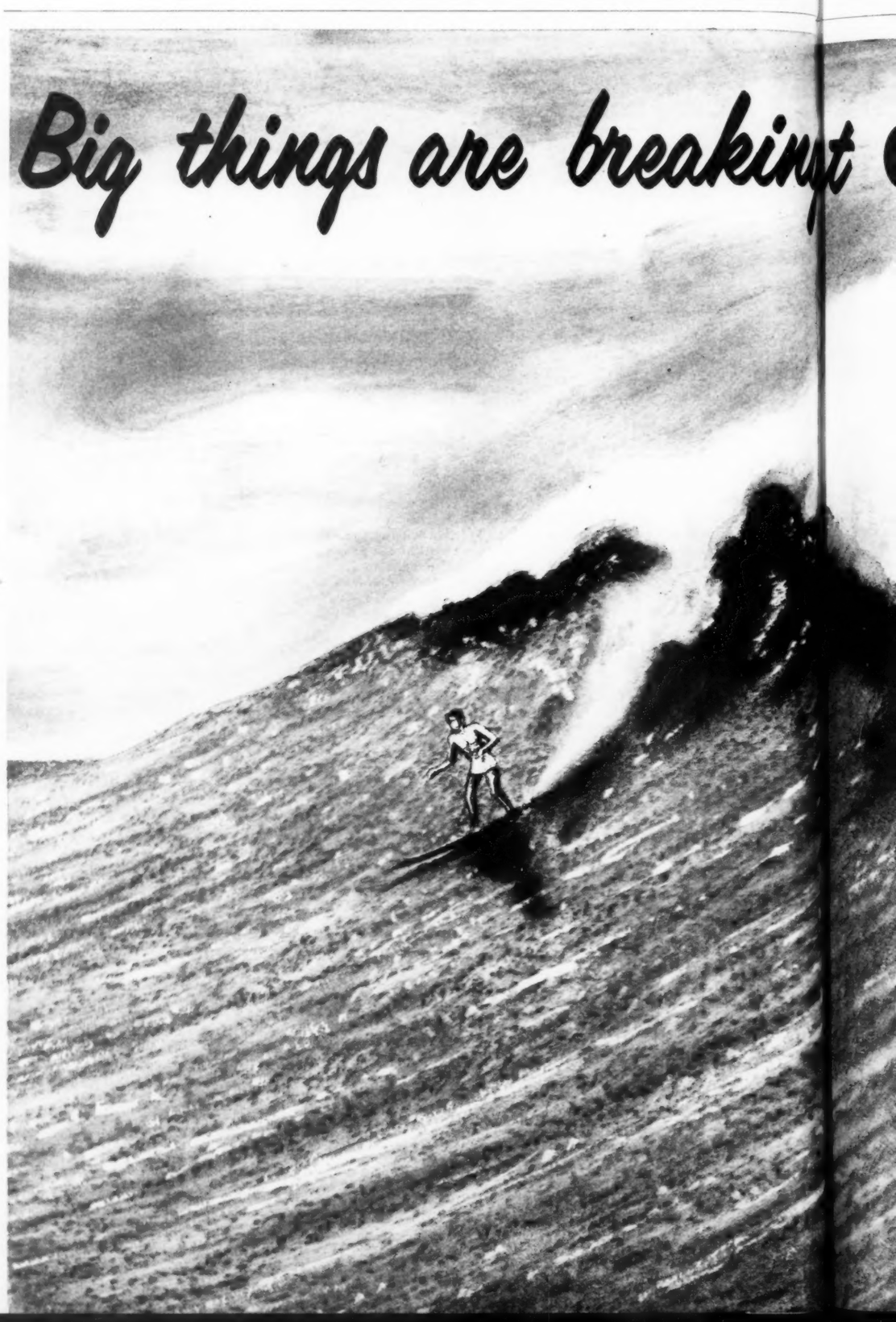
CONSTRUCTION STAKE: Steel unit has nailing holes on 1-inch centers, permitting fastening at nearly every level. Unit is available in 2, 2½, and 3-foot lengths. **Universal Form Clamp Co.**, 1238 N. Kostner Ave., Chicago, Ill. Circle No. 275.
*(Booths 13, 14 at AED Condex Show)*

TWO-WAY RADIO: Bantam operates on 6, 12, 24, and 32-volt dc or 117-volt ac without modification, adjustment, or outside converter. **Bendix Radio Division,** Bendix Aviation Corp., Joppa Road, Baltimore, Md. Circle No. 274.
*(Booth 8 at ARBA Road Show)*



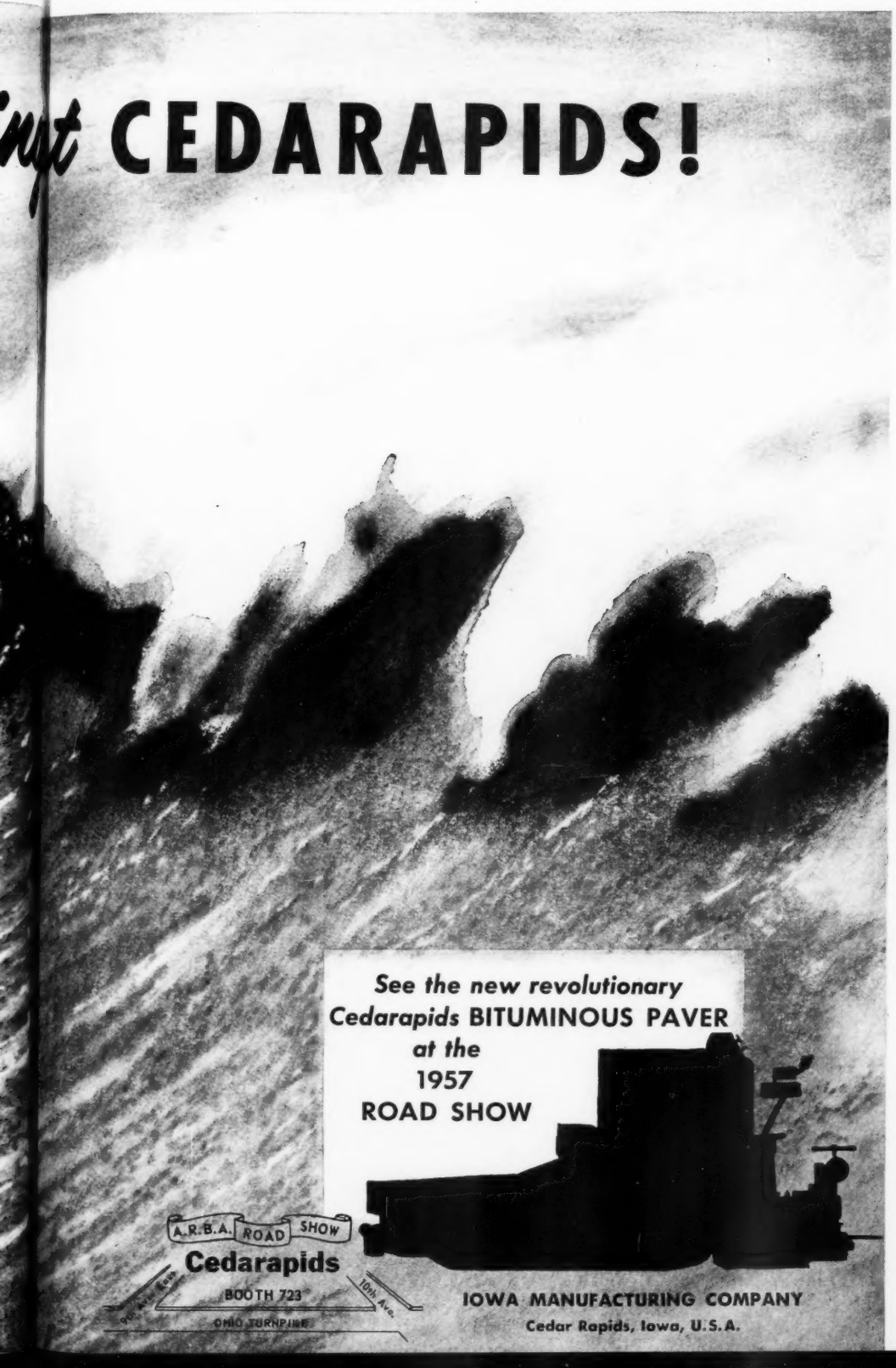
BATCHING SYSTEM: Electronic Helco-Matic Batchmaster batches according to specifications coded on IBM cards. **Heltzel Steel Form & Iron Co.**, Warren, Ohio. Circle No. 249.
*(Booth 719 at ARBA Road Show)*

FRONT-END LOADER: Attachment fits all Fordson Major diesel tractors. It is available with ½ or ¾-cubic-yard bucket. Rated capacity is 1,500 pounds at full 10-foot, 7-inch lift. Breakaway capacity is 5,000 pounds. Features include double-acting hydraulic cylinders, high-capacity vane-type hydraulic pumps, and full-circulating hydraulic systems. Tractor & Implement Division, **Ford Motor Co.**, 2500 E. Maple Road, Birmingham, Mich. Circle No. 250. *(Booth 312 at ARBA Road Show)*



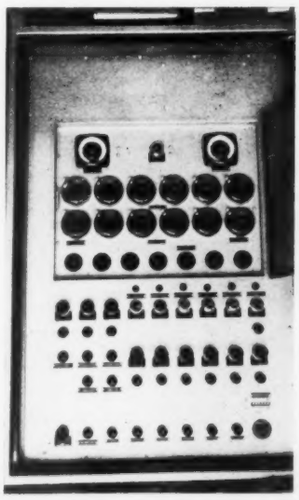
SELF-PROPELLED SCRAPER: Cobra has capacity of 7½ cubic yards struck and 10 cubic yards heaped. Rig features fluid-coupling drive, positive-power Gear-Steer actuated by hydraulic rotary cylinders, and special frame and power train that permits one unit to push-load another. Readily accessible gear transfer case allows changing of gear ratios in field without extra parts. **Wooldridge Mfg. Division,** Continental Copper & Steel Industries, Inc., Sunnyvale, Calif. Circle No. 245.
*(Booth 420 at ARBA Road Show)*

TRUCK CRANE: Redesigned Model TM-254 is rig of 20-ton capacity. It can be used as crane, dragline, clamshell, shovel, or trench-hoe. Unit takes ¾-cubic-yard shovel. Features include two-piece 30-foot boom with self-adjusting gantry; operator's independent control of all operations, including power boom hoist; and all-welded construction. **Hanson Clutch & Machinery Co.,** 200 Miami St., Tiffin, Ohio. Circle No. 240.
*(Booth 805 at ARBA Road Show)*



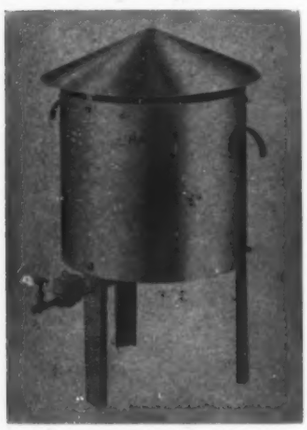
CLAMP: Unit can be used as beam or column clamp without change. It can also be used for curbs, pilasters, and on top of walls to eliminate one or two rows of wall ties. Clamp is adjustable from 5 to 30 inches. **Ellis Equipment Co.,** 211 N. W. Fourth St., Oklahoma City, Okla. Circle No. 141.



BATCHING CONTROLS: Automatic set-up controls weighing of both aggregates and asphalt, and mixing cycle. When controls have been set, button is pushed and correct mix and proper number of batches are dumped. Red light flashes to indicate completion of cycle. **The Simplicity System Co.,** Riverside Drive, Chattanooga 6, Tenn. Circle No. 290.
*(Booth 807 at ARBA Road Show)*

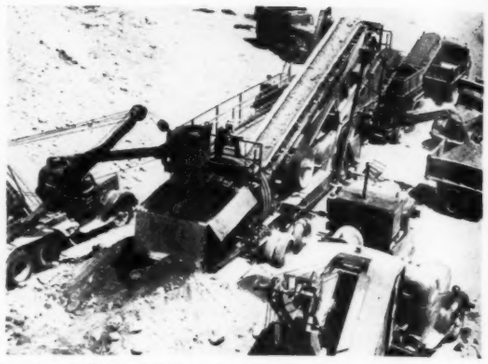
TIRE SERVICE: Firm offers contractors on-the-job tire maintenance. Services include recapping and repairing grader and other earth-moving equipment tires in sizes from 11.00×24 through 33.50×33. Crews of skilled maintenance men cover 30 states. **Carolina Tire Co.**, 232 N. Main St., Salisbury, N. C. Circle No. 241.
*(Booths 5 and 6 at ARBA Road Show)*

PERSONNEL TRAILER: Campcar Economy 21 includes two bunks, refrigerator, stove, toilet, shower, wash basin, wardrobe, heater, dining area, living area, storage cabinets, and screened windows and doors. Trailer measures 21¼×8×9½ feet. **Morrison Railway Supply Corp.**, 1437 Bailey Ave., Buffalo 12, N. Y. Circle No. 311.



SALAMANDER: Heavy-duty chamber unit burns LP gas and is fired by either low or high-pressure internal jet burner. Unit is available in two sizes: 150,000 and 225,000 Btu. High-pressure burner is for gas at from 10 to 25 psi and is furnished with control valve. **Hauck Mfg. Co.**, 116-126 Tenth St., Brooklyn, N. Y. Circle No. 308.

SELF-PROPELLED SPREADER: Spread-Master pulls materials truck backwards, out of gear, reducing wear and tear. Built-in cutoff gates permit spreads of from 6 to 13 feet. Large storage capacity of hopper allows continuous operations. Hand-controlled conveyors operated independently by two clutches. **Flaherty Mfg., Inc.**, P. O. Box 1042, Pocatello, Idaho. Circle No. 233.



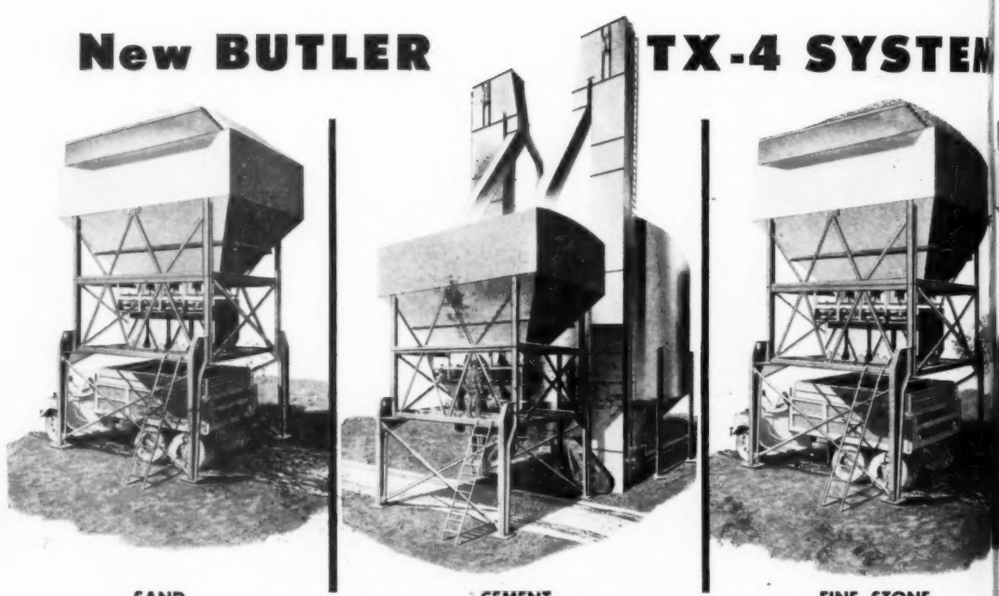
PORTABLE CRUSHING PLANT: Comanche set-up consists of reciprocating plate feeder, Grizzly-King or Rock-Ram jaw crusher, roll crusher, Screen-All vibrating screen, and belt conveyors with Ever-Seal Idlers. Two larger models have hydraulically-lowered screens. Largest model has 12×36-inch jaw crusher and 30×20-inch roll crusher. **Lippmann Engineering Works, Inc.**, 4603 W. Mitchell St., Milwaukee 14, Wis. Circle No. 247.


A WORLD'S FIRST . . .

One-Man Op

HANDLES 4 BAT

New BUTLER TX-4 SYSTEM



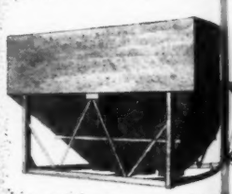
SAND CEMENT FINE STONE CO

Designed for ULTRA HIGH SPEED BATCHING—for Four Pavers and ONLY ON

Batchers are pre-set for any specification and controls are mounted on aggregate bins so that batching is controlled automatically and discharge handled by the truck driver as he passes under the bins. All push button controls for all plants can be operated by the single batcher man located on the cement platform. Interlocking is built into the system so no set of batchers can be discharged until proper weights are reached, and no batchers can be filled until all materials are completely discharged.

Maximum Portability in Rebuilde

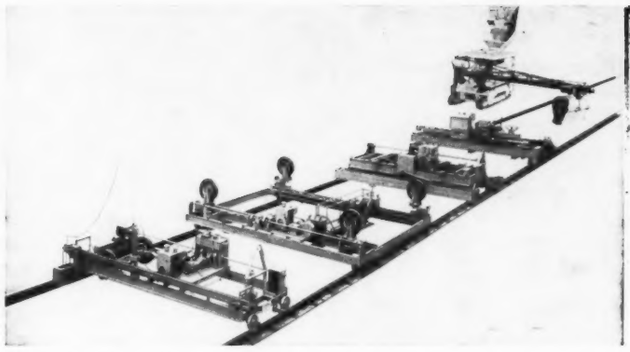
The new BUTLER TX-4 Batching System has many built-in features that assure easier erection, dismantling and moving. Designed with a minimum of units, pre-assembled, they require only simple bolting in the field, and piping or wiring. Bin sections are shipped in one piece, batcher sections shipped with wiring and piping attached. All wiring and piping in the field are done with special quick connectors. And the TX-4 is the only road builders plant with generous clearance for trucks.



Bins are completely pre-assembled for easy crane handling with hinged columns.

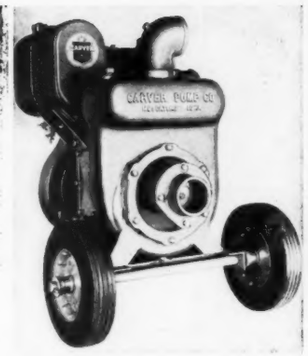
PIONEERS IN **AUTOMATION** FOR READY MIX, ROAD BUILDERS AND CONCRETE PRODUCTS

CONCRETE MACHINE: Model DC has mixing and loading device as integral part, unlike previous models. With five man team, rate of placing is 5-cubic yards per hour. Dual mixing chambers allow continuous operation. **True Gun All Equipment Corp.**, Midstates Bldg., Tulsa, Okla. Circle No. 237.



ROADBUILDING TRAIN: Set-up consists of paver, spreader, finisher, longitudinal float finisher, and curing machine, all riding on reusable steel forms made by the manufacturer. Spreader handles all types of mixes, including low-slump concrete. Finisher has power-operated frame adjustment that allows quick widening or narrowing to match form width. **Chain Belt Co.**, 4701 W. Greenfield Ave., Milwaukee, Wis. Circle No. 238.

*(Booths 346 and 724 at ARBA Road Show)*



PORTABLE PUMP: Model K-302 has capacity of 20,000 gph. Suction and discharge ports are 3 inches in diameter. Power is supplied by 9-hp engine. **Carver Pump Co.**, 1404 Hershey Ave., Muscatine, Iowa. Circle No. 235.

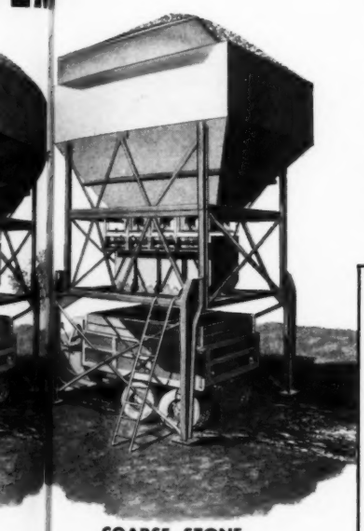
*(Booth 56 at AED Condex Show)*


# an Operation

## 4 BATCHES SIMULTANEOUSLY

### New BUTLER TX-4 Keeps Pace with FOUR 34E Dual Drum Pavers

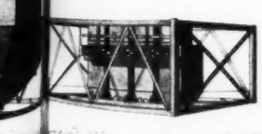
Here's new engineered Automation so flexible, so fast, so dependable that it *obsoletes* all existing roadbuilders' plants. It's the new BUTLER TX-4 System, the modern batching plant that every contractor today *needs* to compete successfully. The contractor with only one paver starts with a TX-4 plant equipped with 2 batchers, and, as he expands with the road program, he simply adds additional batchers to the *same bins* to take care of 2, 3 or 4 pavers — and still retaining ONE-MAN OPERATION!



COARSE STONE

ONLY ONE OPERATOR

Roadbuilders Plant



or four-batcher units are ped, handled, moved and with all piping and wir- in place.

### How BUTLER TX-4 System fits Your Expansion Plans

**THE BASIC UNIT**

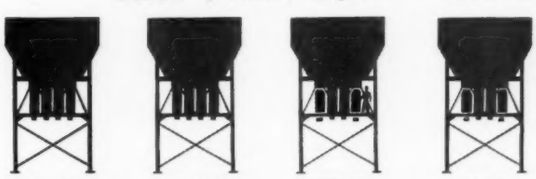
*Handles one or two-batch trucks simultaneously*

This Basic Plant, at minimum investment, provides facilities for batching for two-batch trucks — with one operator.

COARSE STONE | FINE STONE | CEMENT | SAND

**E-X-P-A-N-D-E-D UNIT**

By merely adding extra batchers, at minimum extra cost, the Expanded Unit handles three or four pavers working at optimum production, charges 3- or 4-batch trucks

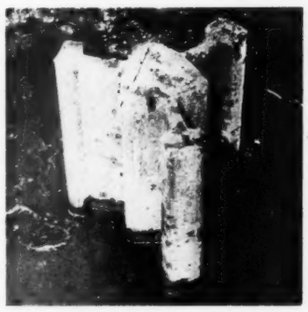


COARSE STONE | FINE STONE | CEMENT | SAND

*Write for FREE copy of this Bulletin giving complete details and specifications on every phase and feature of the new BUTLER TX-4 Road Building Systems.*

**BUTLER BIN CO.** 971 Blackstone Avenue Waukesha, Wisconsin

For more facts, use Reader-Reply Card opposite page 18 and circle No. 454

FOUNDATION PILE: Unit consists of three steel rail sections welded together at base edges to form, in cross section, hollow equilateral triangle with rail heads extending outward at 120 degrees. **L. B. Foster Co., Inc.**, P. O. Box 1637, Pittsburgh 30, Pa. Circle No. 234.

CONCRETE VIBRATOR: Model CV-2's universal-type motor-in-head operates on 115 volts, ac or dc, at 25, 50, or 60 cycles. Head vibrates at 12,000 rpm in 2-inch-slump concrete. **Thor Power Tool Co.**, 175 N. State St., Aurora, Ill. Circle No. 236.

*(Booth 706 at ARBA Road Show)*

COUPLER: Automatic device for narrow-gage muck cars eliminates hazards of hand coupling. It is easily installed with bolts and reportedly costs only half as much as comparable equipment. Made of cast steel, coupler engages in seconds from any position. **Mayo Mine and Tunnel Equipment**, P. O. Box 1413, Lancaster, Pa. Circle No. 309.

# Materials review

***Developments in additives, coatings, sealing compounds, electrodes, and other construction and maintenance materials***

PROTECTIVE PAINT: Inertol is bituminous coating that waterproofs and protects concrete, steel, and wood against acids, alkalis, submersion in water, and abrasion. It is recommended for bridge piers, retaining walls, pipelines, and equipment. Inertol Standard is highly refined coal-tar enamel that gives hard, glossy, black finish. Inertol Standard Thick is heavier and not as glossy. **Inertol Co., Inc.**, 480–490 Frelinghuysen Ave., Newark 5, N. J. Circle No. 306.

IRON POWDER ELECTRODE: Murex Speedex R is said to reduce time and labor in all position welding. More stable arc and better shielding direct and control weld metal as electrode burns to stub. Fast-freezing deposit wets and spreads quickly, minimizing efforts to control undercutting as well as size and shape of weld. Thin glassy slag is readily removed without difficulty in confined joints or vertical down-welds. Electrode assures clean, smooth, sound deposit with better bead shape using normal techniques and arc length. **Metal & Thermit Corp.**, P. O. Box 471, Rahway, N. J. Circle No. 293.

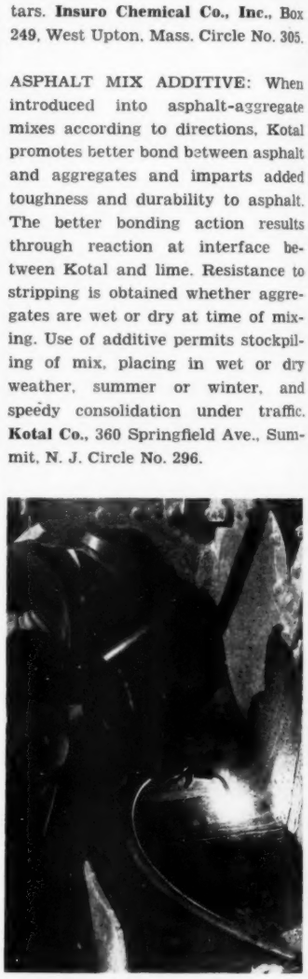
DOWEL BASKET ASSEMBLY: Flexible unit permits maximum spacing between lock rings. Each dowel is supported and locked at four points, assuring positive spacing, height, and parallel alignment. **Universal Form Clamp Co.**, 1238 N. Kostner Ave., Chicago 51, Ill. Circle No. 302.

*(Booths 13 and 14 at AED Condex Show)*

CEMENT INTENSIFIER: Insuro is chemical emulsion in liquid form that is recommended for water-repelling, quick-setting, hardening, dust-proofing, bonding, and intensifying all cement mixtures. It aids in producing improved concrete with early and permanent strength. When steel-troweled, it produces hard glossy surface highly resistant to abrasion, oil, and destructive acids. It is also effective anti-freeze for cement and mortars. **Insuro Chemical Co., Inc.**, Box 249, West Upton, Mass. Circle No. 305.

Universal dowel basket assembly.

ASPHALT MIX ADDITIVE: When introduced into asphalt-aggregate mixes according to directions, Kotal promotes better bond between asphalt and aggregates and imparts added toughness and durability to asphalt. The better bonding action results through reaction at interface between Kotal and lime. Resistance to stripping is obtained whether aggregates are wet or dry at time of mixing. Use of additive permits stockpiling of mix, placing in wet or dry weather, summer or winter, and speedy consolidation under traffic. **Kotal Co.**, 360 Springfield Ave., Summit, N. J. Circle No. 296.



Welding with Stoody coiled wire.

WELDING WIRE: Fabricated coils of small-diameter wire, used in semi-automatic welders for build-up and hard-facing applications, deposits weld metal in greatly increased rate over large-diameter wire of any given amperage. Use of wire is said to sharply reduce welding time and welding costs. All standard semi-automatic welders can be converted to use this wire easily and inexpensively. Wire is available in several different analyses designed for all types of applications, from build-up of manganese

...Designed to stand up where others let down!




Unsurpassed for ruggedness, strength and dependability, General Truck Tires deliver the maximum in profitable performance. From the big, new All-Duty LCM with extra wide treads for tractor-like drive and flotation, to the rough, tough HCT Logger, the General Truck Tire performs better because *it's built better!* You'll get the job done faster and for more profit when you switch your equipment over to Generals.

*specify GENERALS on your new equipment*

THE GENERAL TRUCK TIRE




THE GENERAL TIRE & RUBBER CO., Akron, Ohio

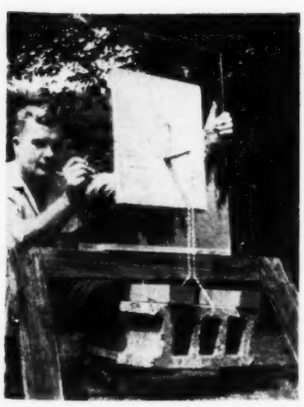
For more facts, use Reader-Reply Card opposite page 18 and circle No. 455

parts to deposition of tungsten-carbide overlays. **Stoody Co.**, 11936 E. Slauson Ave., Whittier, Calif. Circle No. 298.

CLEANING SOLUTION: Saf-T-Klenz masonry cleaner is substitute for muriatic acid and is used for removal of lime and mortar from brick and other masonry work. New solution is said to have cleaning qualities of strong liquid acids but with extremely low corrosion rate. Though it has acid base, it is packaged in powder form and will not irritate skin. It does not generate strong fumes. It is harmless to most metals and causes no noticeable discoloration nor other harmful effect on sandstone, limestone, brick, quarry tile, prepared mortar or lime-cement mortar. It is applied with brush and flushed with clear water. **Berman Chemical Co.**, 840 Superior St., Toledo 4, Ohio. Circle No. 297.

CALCIUM CHLORIDE: Chemical speeds the setting of concrete in temperatures below 70 degrees F. For example, at temperature of 25 degrees F, addition of 2 per cent calcium chloride to concrete mix brings about strength of 2,000 psi in less than 8 days. Peladow is 94 to 97 per cent concentration in pellet form, and Dowflake is 77 to 80 per cent concentration in flake form. Chemical also makes concrete more workable and assures complete fill in forms and faster flow through chutes. **Dow Chemical Co.**, Midland, Mich. Circle No. 294.

OPEN GEAR LUBRICANT: Spray-Lube is now supplied in 16-ounce aerosol containers. Cans fits into pocket and spray application eliminates waste and mess. Lubricant is used to spray all gears not running in oil. It will not drip or spin off running gears and it remains flexible under extremely cold conditions. It can also be used in temperatures too high for normal oils and grease. **Pressure Products Co.**, P. O. Box 342, West Chester, Pa. Circle No. 301.

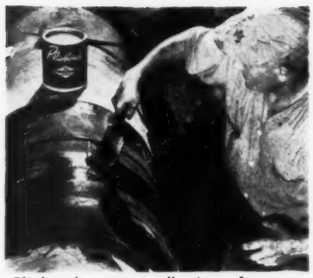


Thorobond supports enormous weight.

BONDING AGENT: Liquid assures adhesion of new coatings to existing surfaces. Within 50 minutes after Thorobond has been sprayed or brushed on, application of gypsum plaster, cement wall and floor tile, and other materials can be started. Agent is non-toxic, non-flammable, and unaffected by freezing and thawing. It has tensile strength of 600 psi. It is not affected by alkalinity of materials it bonds, it will not deteriorate, and it is inert. Gallon of Thorobond will cover 100 to 400 square feet. **Standard Dry Wall Products, Inc.**, Box X, New Eagle, Pa. Circle No. 147.

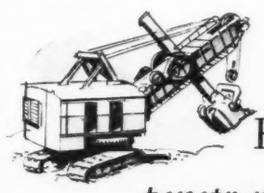
BLACKTOP PAVEMENT SEALER: Solac is coal-tar emulsion designed to protect asphalt pavements against effects of jet fuel, gasoline, oil and grease, oxidation, frost, and other destructive elements. It has high flexibility, is non-flammable, requires no mixing, and is non-fading. Coating gives smooth, non-porous surface to which snow and ice will not adhere. **Lancaster Chemical Corp.**, Solac Division, Broad and 13th St., Carlstadt, N. J. Circle No. 299.

RELEASE COATING: Powerfilm MRC resists sticking of concrete, clay, moist dirt, lime, snow, and other materials. It is recommended for use in concrete forms to facilitate form stripping, in dump bodies, in shovels and buckets, in mixers, and on snow-handling equipment. It may be applied to wet surfaces because it chemically replaces water. Because of its thixotropic properties it will not run or sag. It contains rust preventive additive that will not harm surfaces. It leaves no oil stain on concrete or other surfaces. Powerfilm MRC can be removed with petroleum solvent or cleaning naphtha. **The Thomas Co.**, 1645 Hennepin Ave., Minneapolis 3, Minn. Circle No. 303.



Pliobond assures adhesion of wraps.

ALL-PURPOSE ADHESIVE: Pliobond, when applied to wirebrushed and cleaned areas of pipe, assures adherence of corrosion and electrical-resistant wraps. It also adds insulating properties to pipe. **Goodyear Tire & Rubber Co.**, Chemical Division, Akron 16, Ohio. Circle No. 307.

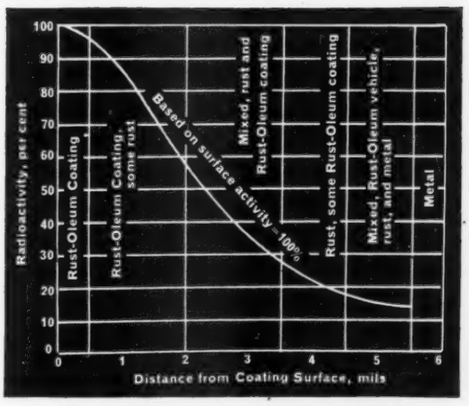
Here's how **RUST-OLEUM**®
*penetrates rust* to bare metal
on your rusted surfaces
as seen through the "eyes"
of radioactivity

Illustration of cross section of rusted metal coated with Rust-Oleum (enlarged 150 times)

**Geiger Counter Traces Rust-Oleum Penetration Through Rust to Bare Metal**

When you apply Rust-Oleum 769 Damp-Proof Red Primer directly over rust, the specially-processed Rust-Oleum fish oil vehicle works around the rust particles, through the fissures in the rust formation, and into the pits in bare metal—driving out air and moisture. *Irrefutable proof* of this penetration is now yours . . . the results of nearly three years' research utilizing radioactive tracing with $C^{14}$ radioisotope.

The methods and results of this research are presented in a complete thirty-page report, entitled "The Development of a Method to Determine the Degree of Penetration of a Rust-Oleum Fish-Oil-Based Protective Coating into Rust on Steel Specimens," prepared by Battelle Memorial Institute technologists. Clip the coupon to your letterhead for your copy. There is no cost or obligation.

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☐ Please send me without cost or obligation the complete thirty-page report on Rust-Oleum penetration.

☐ Complete literature and color charts showing Rust-Oleum colors to match most equipment manufacturers' original colors.

☐ Nearest source of supply.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 456

A Cat No. 12 motor grader blades a path through the fallen rock blocking the Clackamas Road.

# Scrapers, trucks team up to haul excavation for North Fork Dam

A hydroelectric project requiring some unusual construction is North Fork Dam, a concrete arch structure 190 feet high and 910 feet long, which is being built on the Clackamas River in Oregon by Guy F. Atkinson Co., South San Francisco and Long Beach, Calif.

Not unusual is the dam itself, a $20 million project of the Portland General Electric Co. It will have a powerhouse with two generators having a combined capacity of 53,000 kw. When the project is completed in July, 1958, and the second generator goes into operation in November, 1958, a total of 97,000 kw will be produced for PGE facilities in less than five miles of the river. Unique among the features of the project, however, are the extensive and elaborate fishery facilities that will be built as soon as the excavation assignment is done.

### Dirt work under way

The earthmoving work, calling for 1,400 feet of road to be moved back into the right abutment to make room for the spillways, involves some 350,000 yards of material, 150,000 yards of which is mostly basalt.

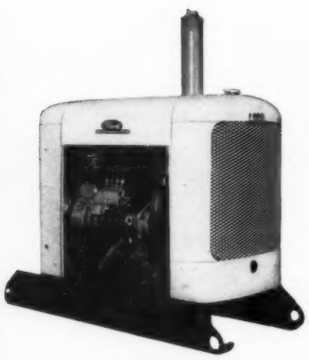
A Cat D8 with a root rake was used for clearing the area so that spillway excavation could get under way. This is being handled by two Cat DW21 scraper units that are push-loaded by a D8, a Cat No. 463 scraper, and a No. 80 scraper. Five D8's, a D9, and a No. 12 motor grader are included in the regular force.

The large amount of rock at the site is being drilled by a Joy machine, three Gardner-Denver wagon drills, and four Air Tracs. The Joy uses a 4-inch carbide-tip drill and works on 8 to 10-foot centers. The remaining drills, using 2½-inch carbide-tip drills, work on 6-foot centers. About 16 holes are used for each shot, which blasts the rock in 20-foot lifts. The dead rock, extremely hard to break, is being shot with Olin 40 per cent explosive that yields about a yard per pound.

A 2½-yard shovel or a Bucyrus-Erie 38-B shovel with a 1½-yard dipper are loading the six Euclids that are wasting most of the material below the dam site.

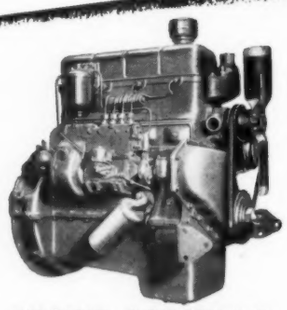
(*Continued on page 60*)


Announcing THE FORD "220" DIESEL ...now available as a complete power unit!



POWER UNIT

Ford INDUSTRIAL ENGINES AND POWER UNITS



ENGINE ASSEMBLY

Looking for really *modern* diesel power? Here it is in one complete 4-cylinder, 220-cu. in., skid-mounted power unit.

Modern design throughout makes this Ford diesel outstanding in power and economy. It delivers more actual sustained power at the flywheel than ever before possible in engines of comparable displacement. Exceptionally rugged in construction, it is quality-built throughout for longer life.

Features such as replaceable cylinder sleeves, aluminum pistons and balanced crankshaft, for example, give you peak performance, longer engine life. Overhead-valve efficiency boosts economy, makes servicing easier.

Drop in and see your Ford Industrial Power Dealer for full information on this modern, super-efficient Ford diesel. Or write: Industrial Engine Department, Ford Division of Ford Motor Company, P.O. Box 598, Dearborn, Michigan.

**WET CYLINDER SLEEVES**
Replaceable cylinder sleeves are positively located, yet easily removable —eliminating costly reboring. Synthetic rubber seal ring at bottom of jacket.

**FOUR-WAY INJECTOR**
Precision made four-way injector disperses diesel fuel evenly into each cylinder for efficient combustion, more power, and greater fuel economy.

**ROTATING EXHAUST VALVES**
Exhaust valves are free-turn type, designed to rotate each time valve opens and closes. Makes for even wear, helps maintain compression longer.

See the FORD INDUSTRIAL ENGINES at the: AMERICAN ROAD BUILDERS ASSOCIATION ROAD SHOW
International Amphitheatre
Chicago, Illinois
Jan. 28—Feb. 2
Booth 825

YOUR JOB IS WELL-POWERED WHEN IT'S FORD-POWERED!

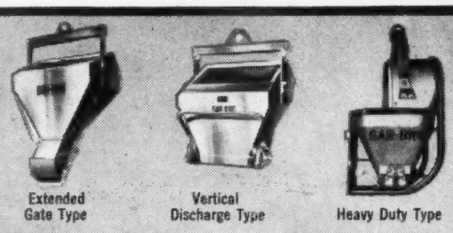
For more facts, use Reader-Reply Card opposite page 18 and circle No. 457

**ROUND CONCRETE BUCKETS**

**Select from 17 models** of Gar-Bro Buckets ranging from ⅓ to 8 cu. yds. There are types for handling any concrete from normal slump to the driest low slump. All have Gar-Bro patented, self-closing, double clamshell gates—they are non-jamming and grout tight. Large buckets have air-operated gates with pull chain or remote control.

**ACCORDION RUBBER HOPPERS** (Patented)

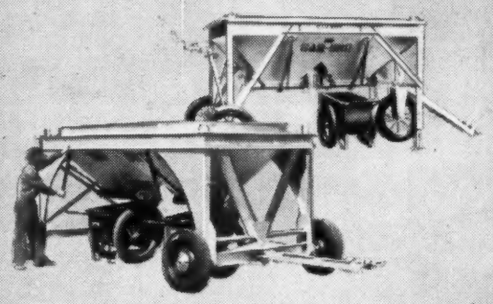
**Only Gar-Bro Buckets** can be equipped with an Accordion Hopper. It is an exclusive patented bucket attachment that confines concrete when pouring into narrow forms. It fastens directly to gate and opens and closes with the gate.



Extended Gate Type | Vertical Discharge Type | Heavy Duty Type

**LAYDOWN BUCKETS**

**They lay down and roll over** to a low loading height and automatically resume a vertical position when lifted. 16 standard models ranging from ½ to 3 cu. yds. of three types to suit any job.



**PORTABLE HOPPERS**

**6 Models** with three types of mountings are available in the Gar-Bro line. They save truck mixer waiting time and prevent delay of the cart crew and finishers. Have low (70" to 75") loading height and 36" clearance for cart loading.

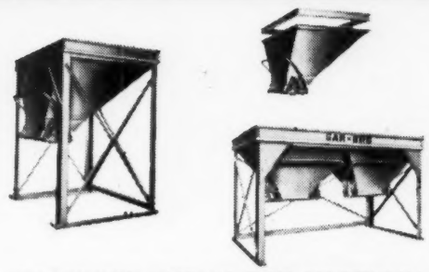
*Only GAR-BRO offers*

# A COMPLETE SELECTION

*of concrete handling equipment*

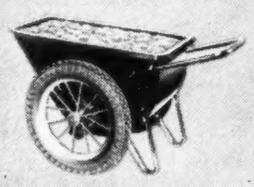
**ONLY GAR-BRO SPECIALIZES** in concrete handling equipment. And only Gar-Bro has a complete line of more than 300 equipment items to give you a complete selection of types and sizes to suit your concrete placing job. Gar-Bro's 30 years of experience makes a big difference in the ease of operation . . . in the efficiency . . . and in the extra advantages of Gar-Bro equipment for concrete handling—there is no substitute.

**GAR-BRO MANUFACTURING CO.** Los Angeles, Calif. • Peoria, Ill.
**GENERAL OFFICES:** 2415 E. Washington Blvd., Los Angeles 21, California



**RECEIVING AND FLOOR HOPPERS**

**16 Hopper Units** with capacities from 1 to 5.3 cu. yds. are convertible from a Receiving Hopper to a Floor Hopper by use of leg stands. Both vertical front and center discharge type are available in single or double gate types.

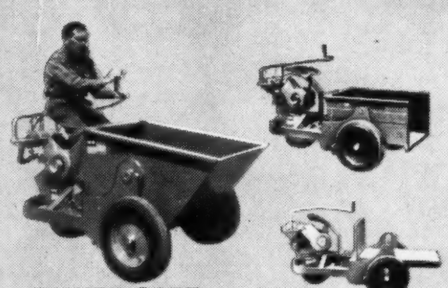


**CONCRETE CARTS**

**All carts are not the same.** Gar-Bro Carts are "balanced" — when loaded . . . easier to handle . . . easier to push. 3 sizes: narrow and standard 6 and also 8 cu. ft., rocker dumps.

**COLLECTION HOPPERS**

**A Choice of 87 Items** are available in Gar-Bro's line of Collection Hoppers and Concrete Chutes. Each is engineered by concrete handling experts to answer any concrete placing problem.



**POWER-CART**

**Designed for Concrete Handling** and for faster, safer operation on temporary runways. Handles 12 cu. ft. . . . turns in 4′ radius . . . controls dumping . . . operates on 2 gal. of gas per day. Light and fast either forward or reverse.

*Designed with concrete in mind...*

# GAR-BRO

*The world's most complete line of* **CONCRETE HANDLING EQUIPMENT**

Write for catalog and Concrete Handling Manual.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 458

Blast holes are put down at 6-foot centers in the basalt rock by a Gardner-Denver wagon drill and compressor. Rock is being blasted loose in 20-foot lifts.

(Continued from page 58)

**Cofferdams under construction**

One cofferdam, containing 12,000 yards of rock in the downstream and upstream sections and having a concrete wall extending along a rock ledge to connect the two arms, has already been constructed. Working in 8 feet of water, Atkinson excavated 50 feet through river-run rock to a solid rock formation to construct this first cofferdam. This south half of the arch dam will contain three temporary sluice gates, 15 feet in diameter. Work on the second cofferdam will start after the spring runoff, possibly the first of July.

This diagram shows the location of North Fork Dam in relation to other power facilities on the Clackamas River, plus the 2-mile ladder and the 5-mile bypass to be used by fish migrating on the river.

**Concrete pours**

Both the concrete-arch dam and the powerhouse will require a total of 100,000 yards of concrete and 1,500 tons of reinforcing steel. Placing operations will be handled by two Colby Model 240 revolving cranes with 4-yard buckets and 140-foot booms. Atkinson is planning to set up a Noble 4-yard batch plant at the site when this phase of the work is ready to start.

The concrete arch dam, 190 feet from bedrock, 700 feet along the arch, 32 feet thick at the base, and 8 feet thick at the top, is formed on a radius of 295 feet. The spillway will contain three trunnion-mounted tainter gates, 40 feet high and 50 feet wide. The reservoir it forms will stretch four miles behind the concrete barrier and cover a total of 346 acres.

Two penstocks, each 100 feet long and 14 feet in diameter, will feed the generators. Two vertical Francis-type turbines, supplied by the Newport News Shipbuilding Co., will provide 53,000 kw. Each 34,500-hp, 52-pole generator will operate on an average head of 135 feet.

**Fishery facilities**

The most unusual construction involves the two-mile fish ladder designed to maintain fish runs in the Clackamas River. This ladder will bypass both North Fork Dam and Cazadero Dam, a smaller facility located downstream.

Around the five-mile stretch between Cazadero Dam and River Mill Dam, Atkinson will build a bypass composed mainly of 16 to 20-inch transite pipe that will handle fish migrating downstream. Without this facility, the fish would either tumble over the River Mill spillway or pass

NEW PAYLOADER®

...STEERED BY ROSS

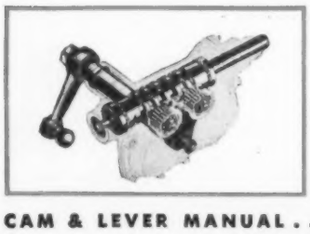
Ross STEERING

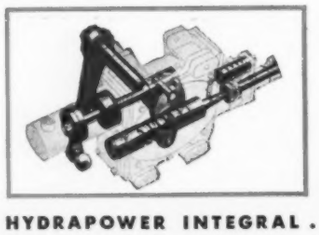
● **Where jobs** are big and tough, there you'll find the new Model HO 4-wheel-drive PAYLOADER tractor-shovel, pictured above, manufactured by The Frank G. Hough Co.

**Among** Model HO's many outstanding features—for great digging power, fast job cycle, and easy, safe operation—is "finger tip" *Ross Hydrapower* steering.

**Here again,** Ross has developed an entirely *new* gear for special steering needs. Ross invites discussion of *any* steering problem —manual or power.

ROSS GEAR AND TOOL COMPANY, INC. • LAFAYETTE, INDIANA





CAM & LEVER MANUAL . . . HYDRAPOWER INTEGRAL . . . HYDRAPOWER LINKAGE

For more facts, use Reader-Reply Card opposite page 18 and circle No. 459

On the south side of the river, two Cat D8 tractors cut away the overburden on the face of the canyon wall to provide a solid foundation for the dam's buttress plates. The dam will be located at the bridge crossing, background.

through the dam's turbines.

Several other jobs are included in the $8,228,429 contract. One calls for part of the river channel between River Mill Dam and Cazadero Dam to be improved to facilitate the upstream migration of fish about to spawn. At River Mill Dam, the fish will use an existing fish ladder to continue their way upstream.

Another job—the construction of a 23-foot tunnel, 2,250 feet long, to carry Clackamas River water from Cazadera Dam to the reservoir for the Faraday powerhouse—has been subcontracted to Norwood Construction Co., Vancouver, B. C. This tunnel will replace a wooden flume now in use. At Faraday, a 25,000-kw generator is being installed to bring the facilities total output to 44,000 kw.

#### Personnel

Hugh Parker, project manager for Guy F. Atkinson, is being assisted by J. A. Fillebrown, assistant project manager; J. E. Broton, general superintendent; E. J. Dailey, excavation superintendent; Bill Bruguier, project engineer; Charles Atkinson, chief storekeeper; and Gordon Milton, master mechanic. During this initial stage of construction, about 125 men were working two 8-hour shifts, 6 days a week. About 350 men are expected to be on the job in this summer's period of peak activity.

Design and construction management for the project is being handled by Ebasco Services, Inc., New York, N. Y., for Portland General Electric Co. Roger O'Reilly is construction superintendent for Ebasco.

THE END

### Electric heating units

■ A bulletin from the Hynes Electric Heating Division of the Turbine Equipment Co. illustrates and describes the application of low watt density electric heaters for the heating of asphalt storage tanks and asphalt lines in bituminous hot-mix plants. Use of these heaters is said to eliminate coking because there is no localized overheating of the asphalt.

To obtain Catalog A write to the Hynes Electric Heating Division, Turbine Equipment Co., Box 578, Westfield, N. J., or use the Request Card at page 18. Circle No. 162.

### Sealing compound pumps

■ Its line of power-operated pumping systems for dispensing ready-mixed cold-applied sealing compounds to highway and runway expansion and control joints is described in a folder from the Lincoln Engineering Co. The folder lists ten advantages of Lincoln heavy-duty pumps and details two of the pumps, one with an air-operated drum pump in combination with a pressure primer that serves to force the pump and drum cleaner assembly against the material in the drum, and the other with a stationary pump and drum cover assembly.

The advantages of using cold-applied compounds instead of hot-mixed materials are also discussed. The assortment of nozzles that are standard equipment with each pump are illustrated.

To obtain Bulletin 402 write to the Lincoln Engineering Co., 5702–24 Natural Bridge Ave., St. Louis 20, Mo., or use the Request Card at page 18. Circle No. 292.

### Tubular steel scaffolding

■ The applications of its Advance tubular steel scaffolding in construction, maintenance, and repair work are discussed in a booklet from the Beaver-Advance Corp. The booklet covers masonry work, painting, roofing, plastering, building maintenance, and shoring of structural concrete slabs and beams.

To obtain this booklet write to the Beaver-Advance Corp., Box 792, Elwood City, Pa., or use the Request Card at page 18. Circle No. 85.

There's no need to gamble when you can bet on a sure thing!
DROP BLOCK . . . medium weight, with cast iron check weights, swivel hooks . . . numerous sheave sizes and capacities.
HI-LIFT CRANE BLOCK, short overall length, flame hardened steel sheaves, hi-speed bronze bushings or roller bearings. One to three sheaves . . . 15 to 60 ton capacity.
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A Better
CONSTRUCTION BLOCK
For Every Purpose
Illustrated above, three of many types and sizes of McKissick's Better Blocks. Designed to meet the needs of construction men who require superior quality and efficient operation. All sizes and capacities to meet special requirements. Write for complete catalog.
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# Sewage outfall line laid at ocean depth of 200 depth

Stretching out from shore is the wood-pile trestle used by Healy-Tibbits Construction Co. in excavating the 1,000-foot trench for the first section of line. The derrick barge handles the open-water construction.

A 90-inch-diameter reinforced-concrete sewage outfall line, laid in water up to 212 feet deep in the Pacific Ocean off White Point, Calif., has been finished six months ahead of schedule. This record becomes more unique, considering that 70-ton dead-weight lifts had to be made in the open water of the rough Pacific.

This job involved a major extension of sewage discharge facilities of the County Sanitation Districts of Los Angeles County. A new 12-foot-diameter horseshoe tunnel is being built to connect the districts' joint-disposal plant at Torrance and the new ocean outfall. (See "Drilling and Mucking Plan Speeds Sewage Tunnel Project," C&E, July, 1956, pg. 62.) This tunnel and the new ocean outfall line will boost the discharge capacity of the disposal plant from 220-mgd to a total of 400-mgd.

This heavy marine construction job was handled under a combination of contract and force-account work under district supervision. The shoreward 1,000 feet of pipe was laid in a trench cut through solid rock on the ocean floor by Healy-Tibbits Construction Co. The contract price for this work was slightly more than $484,000. The remainder of the line was built by district force that used floating marine equipment rented from the contractor.

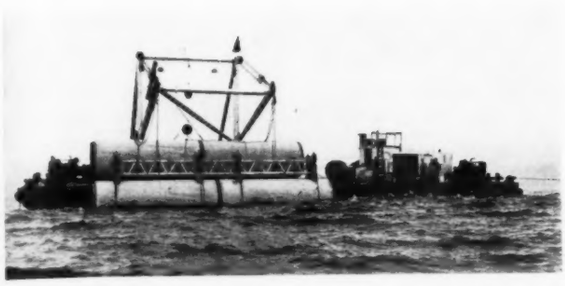
The 90-inch-diameter pipe placed by Healy-Tibbits was encased in concrete for its 1,000-foot length. Adjoining this is 2,200 feet of pipe, also laid in a rock trench, this was given a gravel ballast. Another 4,800 linear feet of pipe brings the line into 200-foot-deep water, where a wye was constructed. This length of line was also ballasted with gravel to the spring line to prevent scour or erosion. Beyond the wye are two 1,200-foot-long concrete lines, 60 inches in diameter. A vent in each section of pipe in these lines makes it possible for sewage to be diffused deep under the surface of the ocean.

### Work from trestle

The work on the initial 1,000-foot section was slow and tough. A wood pile trestle was built out into the ocean alongside the location of the pipeline, so that excavation and pipe-laying could be done. Both a 6-ton rock chisel and high explosives were used to loosen the shale for the trench, and the rock was removed by

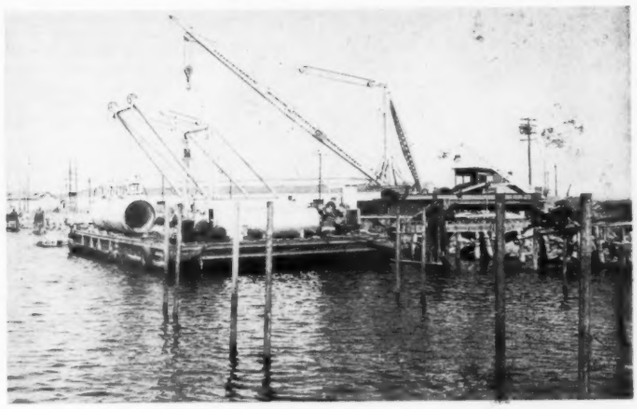

# There's a Trailmobile Trailer for every

Trailmobile offers a single source of supply for every type of "heavy construction" trailer along with factory service facilities in 54 cities from coast to coast. Beyond this, many of Trailmobile's construction features were designed with time saving "on-site" maintenance in mind. All trailers are available on convenient financing up to five years for qualified buyers. For further information on new or used equipment, write Trailmobile Inc., 31st and Robertson, Cincinnati 9, Ohio.



Two sections ride out to the work area off the Pacific coast. The 48-foot section in the water is supported by a heavy steel strongback that will be used during the placing operation.

Heavy sections of 90-inch-diameter reinforced-concrete pipe is loaded to the placing barge by a Clyde stiffleg derrick. Two 48-foot sections, consisting of two 24-foot sections each, are laid daily.



a crane with a Stockton clamshell bucket.

The contractor devised a novel method of moving the trestle-mounted pipe-laying dolly. This rig, with no power of its own, was operated by a Hough Payloader working from the trestle. The concrete encasing the pipe was placed by the tremie method.

#### Work on open water

The toughest part of work on the outfall line started when district crews moved out into the open water. May through November provided the only good working months, the Pacific's ground swells cutting at least 20 per cent into working time during the remainder of the year. The first 2,200 linear feet of line running seaward from the trestle called for the same type of trench excavation in rock that had been done by Healy-Tibbits, and during this early work, operations were halted 13½ out of 121 work days. In good weather, the crews laid an average of 96 feet of pipe.

A powerful derrick barge, rented from Smith-Rice Derrick Barges, Inc., San Francisco, handled the rock excavation job. Mounted on a 52 × 112 × 9½-foot-deep steel hull, the derrick consisted of a Willamette revolving crane that had had its 120-foot boom shortened to 90 feet. The original winding gear on this derrick had also been changed so that the machine was powered by a 325-hp Waukesha diesel engine through a torque converter. The winding gear consists of an American three-drum Model 250 hoist that gives the machine a rated capacity of about 50 tons.

Digging was handled by a 12-ton Stockton digging bucket and a heavy 8-ton rock chisel that had been adapted from an old ship propeller tailshaft. Dropped by a hoist line on the derrick boat, the chisel penetrated the shale rock, helping to break it up. About 5½ tons of 60 per cent powder was also used, in the form of made-up bombs, to loosen the material. Once the formation had been broken, the rock was excavated with the heavy-duty bucket.

#### Pipe laying follows

Since the hydraulic currents along the coast tended to fill the excavation


# highway construction need

**TRAILMOBILE LOW BEDS**
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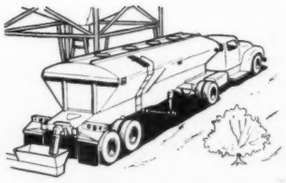

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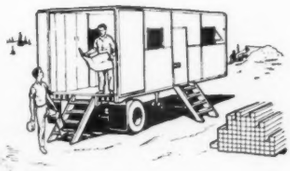
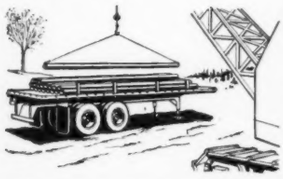
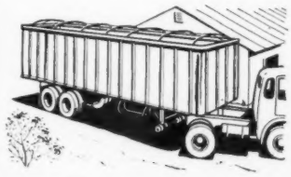
. . . transport large amounts of bulk cement to mixing plants at the job site. Both steel and aluminum types offer exclusive step-down design with twin screw discharge.



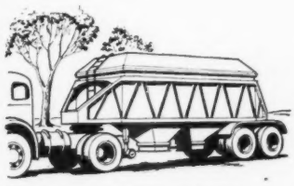
**TRAILMOBILE FREIGHT VANS**
. . . combine weather protection and mobility for hauling general supplies. Low cost used vans provide ideal job site offices, tool shops or storage facilities.



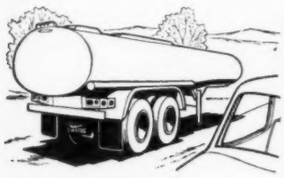
**TRAILMOBILE PLATFORM TRAILERS**
. . . are used for carrying lumber, cement forms, drainage tile, straw bales and sundry light equipment. "Sideless feature" permits simpler, faster loading and unloading.



**TRAILMOBILE OPEN TOPS**
. . . are extensively used for carrying tools and construction materials. These units can be equipped with tarpaulin roof covers to protect contents against sun, rain or snow.



**TRAILMOBILE HOPPER TRAILERS**
. . . are used for carrying and spreading aggregate, gravel and sand. Bottom discharge permits uniform spreading of contents over a wide area.



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**TRAILMOBILE HYDRAULIC DUMPS**
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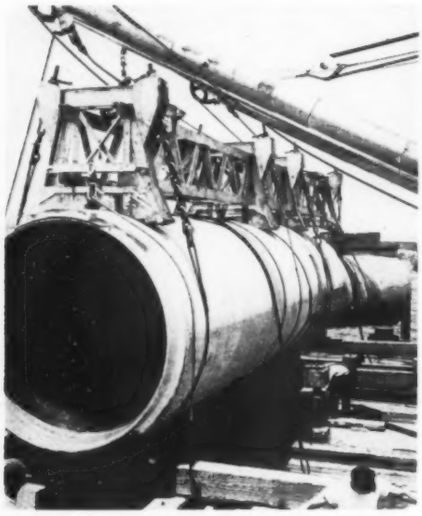


The steel stiffening strongback will support this 48-foot length of pipe as the section is lowered into place. The 90-inch-diameter pipe and the strongback form a 70-ton load for the double-frame derrick.

Three cranes work together to handle the heavy wye section that will be located 8,000 feet offshore in 200 feet of water. Two 1,200-foot lines branching off from the wye will diffuse sewage into the ocean.

almost as soon as it had been dug, the pipe and the gravel encasing it were placed as soon as the trench had been dug. The same floating derrick handled the 24-foot pipe joints, which have an 8-inch-thick reinforced-concrete covering. The sections, supplied by the district under a separate contract with American Pipe & Construction Co., South Gate, Calif., were made in American's South Gate yard, trucked to the harbor at San Pedro, and transferred to the job site by tug and barge. The same barge carrying four pipe sections also carried enough gravel to grade the trench and partially encase this 96-foot section of the outfall line. This barge anchored alongside the derrick barge as the pipe and gravel were placed.

Each pipe section had cast-iron end rings, beveled slightly so that sections can be joined easily. One or two pipe sections were placed with the load line of the floating derrick. A diver on the ocean floor, in charge of all signaling for this operation, saw to it that the sections were pulled together with a tight cable running out from shore. A lead and rubber gasket formed a watertight connection between the two joints, the lead gasket being installed after the pipe had been bedded.

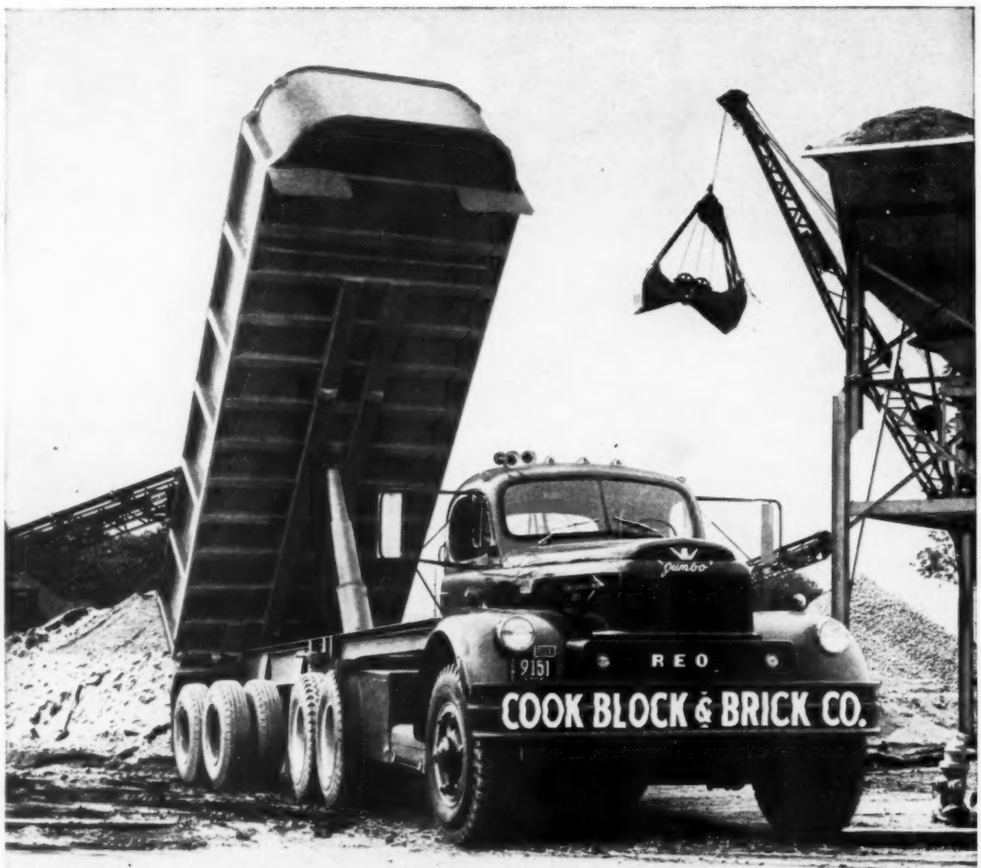
#### Deep-water rig

The use of the derrick barge was discontinued after this portion of the work had been finished, and a steel barge was rented from Smith-Rice to carry a deep-water, more economical rig that installed the remaining pipe sections.

In designing the rig, the district's engineers aimed at getting a machine that would be able to handle the dead weight of a 70-ton load imposed by two joint sections and the lifting strongback, plus another estimated 30-ton load represented by the surge of water as the rig rocked under heavy swells with two joints suspended. Also desirable was a high fpm handling rate on each of the two load lines.

The result was a double-frame derrick, in the form of an H, which had a boom frame built of cargo-handling booms from ships. A ten part boom line was rigged through a series of


LOOK AT REO FOR E




LOOK AT REO IN THE CONSTRUCTION FIELD

Mr. V. E. Cook reports—"We are pulling 72,000 lbs. G.C.W. with Reo's A633-V-8. We were surprised when we weighed the new tractor and found it 2,000 lbs. lighter than other equipment in the 200 H.P. class. Naturally this permits 2,000 lbs. more payload."

American multiple-way blocks to control the H-frame boom.

A two-drum Skagit BU-140 winch with a large-diameter main drum capable of making a 25-ton single-line pull was equipped with a third drum so that the machine had enough room for two main load lines and the boom line. A Chrysler C-36 industrial engine was placed next to the unit for motive power. Friction on the Skagit drums was modified so that compressed-air operation was possible.

In addition to the main hoisting equipment, other Skagit winches were used to control the four anchor lines holding the barge in position. A Gardner-Denver 365-cfm air compressor was also mounted on the deck to supply compressed air to the diver and to the friction controls of the main hoist. A Joy standby compressor, and all diving equipment—including two large decompression chambers—were also placed on the barge.

#### Good production

Daily operations, planned on the basis of four 24-foot pipe joints, started as the swing shift loaded four of the sections on the H-frame barge. Two pair of sections were joined together in two 48-foot-long sections under a heavy steel stiffening strongback that supported their weight during the placing operation.

The day shift towed the H-frame and its load of outfall pipe out to position in about 1½ hours. When the proper location had been reached, the haul in line was made fast to a 48-foot section and the strongback and pipe lowered to the ocean floor.

As the pipe went beneath the surface, all operations were placed under the control of the diver directing the placement of the sections. He worked with a visibility of from zero to 60 feet.

The usual procedure was to start the slip joint, then raise or lower the ocean end of the pipe until the line-up was perfect. The power of both hoist lines was never used once this operation was under way because of the possibility that the outfall line already laid would be damaged.

Once the joint was made, the diver ordered the shore winch lines hauled in so that pipe could be moved to its final position. The haul-in cable remained taut until the diver unbolted the steel strongback, which was then hoisted up to the deck.

#### Personnel

General supervision of the design and construction of the new outfall line was under A. M. Rawn, chief engineer and general manager of the Los Angeles County Sanitation Districts. Lester Haug, construction engineer-superintendent, was in charge of work in the field, and Dan Boom was general superintendent of all offshore marine construction work.

THE END

## HRB issues supplement to publication index

The Highway Research Board has issued a Publication Index supplementing the one published in 1950. The new volume contains references to bulletins, research reports, and other items published during the 1950–1955 period, and to papers and reports presented at the Board's annual meetings during the period covered.

The new publication consists of two sections, an author index and a subject index. The principal subject headings are listed in a table of contents, which also contains cross references.

Priced at $1.95, the index is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

## Trowel trade tools

■ A catalog listing more than 1,500 trowel trade tools for contractors and journeymen is available from the Goldblatt Tool Co. Both hand and power tools are completely described and illustrated. The catalog includes three different types of salamanders, including an LP-gas model; special and general purpose tarps; plastic wind breaks; and a 5-gallon stainless steel hot coffee thermos.

To obtain this catalog write to the Goldblatt Tool Co., 1910 Walnut St., Kansas City, Mo., or use the Request Card at page 18. Circle No. 165.

## Grader advantages listed

■ A catalog covering the Model T-600 Grade-O-Matic grader is offered by the Galion Iron Works & Mfg. Co. The advantages of the torque-converter drive and the power-shift transmission, which are said to increase work production and simplify operation of the rig, are explained. A list of the available attachments for the 140-hp grader is included.

To obtain Catalog No. 415 write to the Galion Iron Works & Mfg. Co., Galion, Ohio, or use the Request Card at page 18. Circle No. 188.

## Clark Equipment appoints

Frank E. Juranek has been appointed general traffic manager of the Clark Equipment Co., Buchanan, Mich. For the past eight years Juranek has been a divisional traffic manager at Clark. Prior to that he was employed by American Airlines.


# EXTRA PAYLOAD

## "2000 lbs. MORE PAYLOAD"

*. . . says Virgil E. Cook, President, Cook Block and Brick Co., Anderson, Ind.*

**An extra ton per trip!** Extra payload means extra profit . . . that's one of the big advantages you get when you haul with Reos. Reo engineering has eliminated excess weight—built in extra payload. Operators the nation over are experiencing the rewards of Reo's weight-saving design.

On their jobs everywhere Reos are setting spectacular records for power and efficiency. About his Reo wet sleeve, short stroke V-8, Mr. Cook says, *"Our operation is over winding, hilly roads which really test a truck when you are pulling a load this size . . . (72,000 lbs. G.C.W.)."* Reo's 207 and 235 h.p. Gold Comet V-8 engines develop a startling 1/2 h.p. per cu. in. displacement—up to 35% more efficient than the industry average. Pound for pound, Reo V-8's are the most powerful truck engines on the road.

Reos have the power to move bigger loads faster. They take grades in up to 1½ gears higher than other trucks on the highway and maneuver better in the city.

Reos haul more payload, haul it faster and haul it easier. You'll find it true on your job, too!

***100,000 mile or 1 year warranty*** on all Reo Gold Comet Engines. This is the assurance you get from the manufacturer of the precision construction and outstanding performance that's built into Reo's rugged powerplants. Find out how you get this amazing warranty on the engine in the next truck you buy. Call your Reo Branch or Distributor today.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 462

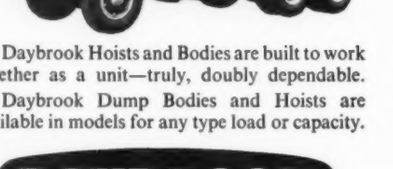
SOME of the 12 million cubic yards of sand silt, silt brown clay, marine clay, and glacial silt that have to be excavated to improve the St. Lawrence for ocean shipping is dumped to an International 95 Payhauler by a Lima 2400 shovel. In some places, the cut will reach 70 feet. Channel improvement work will be completed by June, 1958.


# LOOK TO DAYBROOK

## ...For the New Standard of Quality that Keeps Equipment on the Job!

Daybrook equipped trucks give the contractor and excavator exclusive operating advantages that mean more profitable operation!

- Daybrook Dump Bodies feature heavy-duty understructures—improved hardware—a new standard of workmanship—that take rugged use . . . give longer life.
- Daybrook Hoists are 100% Daybrook design —feature roller bearing type pump—balanced spool, reciprocating type, three-position valve —a sealed hydraulic cylinder that merits a *one-year warranty*.



- Daybrook Hoists and Bodies are built to work together as a unit—truly, doubly dependable.
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*L. A. YOUNG SPRING & WIRE CORPORATION*
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 463


## HRB publishes bulletin, bibliography, and report

The Highway Research Board, Washington, D. C., has issued three new publications, including a bulletin, "Traffic Assignment by Mechanical Methods", a committee report, "Roadside Development", and a bibliography, "The Curing of Concrete 1925–1955".

"Traffic Assignment by Mechanical Methods" contains five papers and a discussion of them presented at the HRB's 35th annual meeting. Subjects included are: the California method of assigning diverted traffic to proposed freeways, a mechanical method for assigning traffic to expressways, traffic assignment using IBM computations and summation, a mechanized procedure for assignment of traffic to a new route, and mechanical methods of traffic assignment. Numbered Bulletin 130, it is priced at $1.50.

"Roadside Development", also presented at the 35th annual meeting, describes various techniques of roadside improvement and maintenance, including chemical weed control, roadside design to reduce traffic noise, roadside parks on limited-access highways, rates of seeding, and median planting for headlight-glare screening. It may be obtained for $1.35.

Bibliography No. 18, "Curing of Concrete 1925–1955", presents a comprehensive list of literature available on the curing of concrete. The publications listed are separated into various classifications, some of which include: factors affecting curing; methods of field and plant curing; and curing equipment. The bibliography is priced at $1.80.

All three publications may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

## Special alloy steel

■ A booklet describing the uses and advantages of Jalloy, the special alloy steel made by the Jones & Laughlin Steel Corp., is available from the company. The booklet discusses the use of Jalloy in shovels, drag buckets, dipper sticks, grader blades, dump-truck bottom-liner plates, liners for rock crushers, and in chute and truck-body liner plates in quarrying plants.

To obtain this booklet write to the Jones & Laughlin Steel Corp., 311 Ross St., Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 167.

## Motorola moves office

The eastern division office of Motorola Communications and Electronics Inc., Chicago, Ill., has been moved from Fort Lee to Ridgefield, N. J. The new office building will house credit, accounting and administrative functions formerly handled at the Chicago general office, as well as sales and service administration functions. This division services customers for Motorola two-way radio and industrial products in a fifteen state area.

An extra-wide, extra-long windshield provides excellent visibility for both the standing and sitting positions in the new comfort-cabs announced by the Oliver Corp. for their Super 99 and Super 99 GM tractors.

## Comfort-cab features full-size windshield

■ A new comfort-cab for its Super 99 and Super 99 GM tractors is announced by The Oliver Corp. Full "stand-up" height and increased visibility for both sitting and standing positions are featured.

A sloping, full-width, full-height windshield is standard equipment; a complete selection of rear and side enclosures is offered—demountable hinged side windows, glass-windowed rear doors, or canvas rear curtains.

According to the company, extra roominess plus good visibility in all directions is provided by the all-weather cab. The top is sheet steel covered with an insulating material that absorbs sound.

For further information write to The Oliver Corp., 400 W. Madison St., Chicago, Ill., or use the Request Card at page 18. Circle No. 133.

*Visit the Oliver Corp. at the Road Show in the International Amphitheatre, Booth 708.*

## Tractor shovels

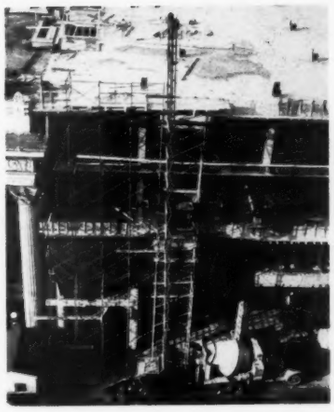
■ Two 4-wheel-drive Payloader tractor shovels are described in bulletins from the Frank G. Hough Co. Model HU, a 1½-cubic-yard unit, has a horsepower rating of 84 in either a gasoline or diesel engine; and Model HH, a 1¾-cubic-yard unit, has a 100 and 92-hp rating for the gasoline or diesel engine, respectively. Features listed for both tractor shovels include a torque-converter drive, power-shift transmission, 40-degree bucket breakout at ground level, and hydraulic brakes.

To obtain Forms No. 307 and 311 write to the Frank G. Hough Co., 822 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 180.

## Tightening bolts

■ The procedures for tightening high-strength bolts are contained in a wall chart from the Skidmore-Wilhelm Mfg. Co. The chart is divided into four sections. The first part deals with the methods of checking high-strength fasteners. The second and third parts cover correct calibrating of torque control and conventional impact wrenches. Instructions for the actual tightening process are given in the last part.

To obtain the wall chart write to the Skidmore-Wilhelm Mfg. Co., 442 Green Road, Cleveland 21, Ohio, or use the Request Card at page 18. Circle No. 174.



POURING THE SECOND-STORY DECK of a new building in Dayton, Ohio, the contractor was able to place 240 cubic yards of concrete in less than eight hours, according to the Buck Equipment Corp. The efficient operation was made possible by Buck's new 17-cubic-foot self-dumping concrete bucket, an accessory for the company's hoisting machine. The concrete bucket is of all-welded construction and has rounded corners to prevent the concrete from sticking. For more details on the new bucket write to the **Buck Equipment Corp.**, 720 Anderson Ferry Road, Cincinnati, Ohio, or use the Request Card at page 18. Circle No. 193.

**Visit the Buck Equipment Corp. at the Condex Show in the Conrad Hilton Hotel, Booth 132.**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1 *2 axle oscillation* | 2 *4 wheel drive* | 3 *4 wheel steering*

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. . . 4-wheel drive and 4-wheel steering made possible by Wagner's Pow-R-Flex coupling.

. . . Tremendous traction because both axles oscillate, keeping equal weight distributed on all four wheels at all times.

. . . Planetary drive minimizes axle strain, tire spinning and wear.

. . . Maximum operator comforts—dust control, smooth riding and optional equipment: demountable cab.

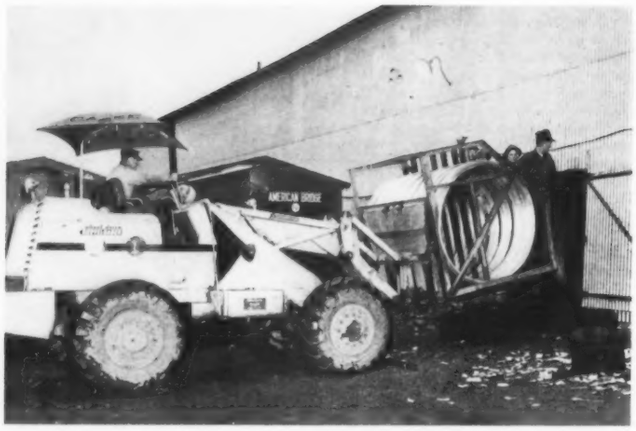
. . . Independent field tests proved Wagner tractors (1) "self-loads" scrapers and moves dirt cheaper per yard than conventional scrapers which require "pushers," (2) operates with less fuel cost, (3) materially reduces maintenance and replacement costs.

*Visit our display—at the Road Show in Chicago, Booth 819, starting January 28 or write for informative literature. Dealerships available in some areas. Inquiries welcomed. Wagner Tractor, Inc. 8025 N.E. Killingsworth, Portland 20, Oregon.*

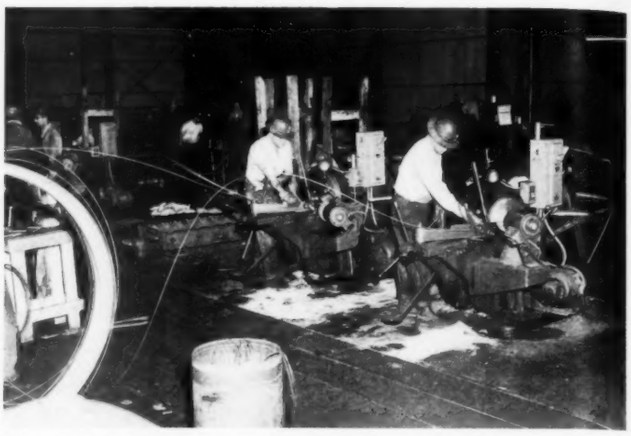
**WAGNER Rubber-Tired Tractors**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 464

# Reeling plant transfers coils of wire to reels for Mackinaw trait



**1** Coils are shuttled from rail car or warehouse to the reeling plant by a Baker-Lull Shoveloader equipped with a special coil rack in place of a bucket. The rack, holding eight coils of wire, can be tilted one way to keep coils from rolling out during transit, or another way to make the unloading job easier for workmen. Coils are picked up by an overhead electric crane and weighed before being broken open.

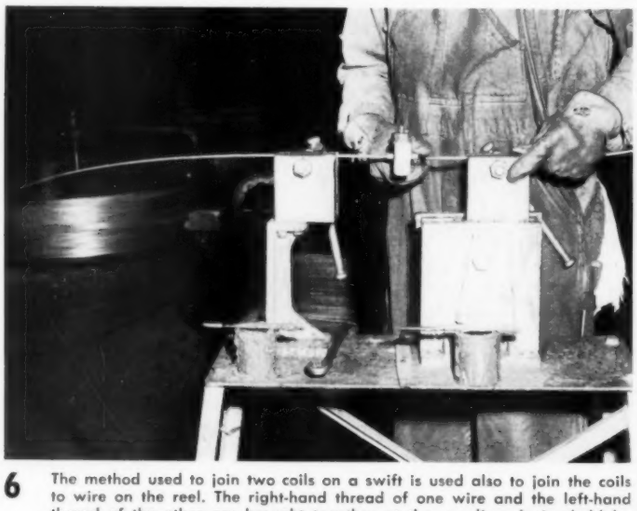


**2** A coil is shaken out to remove tangles before each end is fed to an A. C. Campbell Floformer machine to be upset and threaded. Upsetting the wire permits cutting threads with a root diameter at least as great as the nominal diameter of the wire. In the 3-minute operation, one machine cuts a right-hand thread, the other, a left-hand thread. Both ends are mitered at 45 degrees by grinders and special jigs.

**3** Workmen place the coil over a rewinding swift, mounted in a horizontal position on a heavy base on the plant floor. One end of this coil will be coupled to wire already on the reel by a special coupling device resembling a miniature turnbuckle. The other end of the coil will be coupled to a second coil, which will also be placed on the swift. Wire from the swift will be fed to a reel, background.

**4** Wire goes from the free-spinning swift through a guide box to a tensioning wheel, then through a level-winding device to a reel. The reels, weighing 2½ tons when empty, are 7 feet 10 inches in diameter and 5 feet 10 inches wide. They are mounted in reeling machines powered by variable-speed electric motors. As the motor of the reeling machine rotates the reel, the tensioning wheel keeps a uniform tension on the wire.

**5** The level-winding device, like that on a fishing reel, distributes wire evenly across the reel. After two coils have been transferred from the swift to the reel, the end of the wire is coupled to the start of another two coils on another swift, and the reeling process continues. The weights of the coils are added together to determine the amount of wire on a reel. About 70 coils makeup the 16 tons of wire on a full reel.



**6** The method used to join two coils on a swift is used also to join the coils to wire on the reel. The right-hand thread of one wire and the left-hand thread of the other are brought together at the coupling device held by the workman. As he tightens the coupling, the wires are drawn together until the mitered ends come into contact. These ends fit together to prevent either wire from turning out of the coupling.

# traits span

***Machines upset and thread ends of 500-pound coils of wire, then wind 16 tons of continuous wire on huge reels***

Between the wire-drawing operation at the Trenton, N. J., works of the American Steel & Wire Division of U. S. Steel Corp. and the cable-spinning operations of the American Bridge Division out on the Straits of Mackinac Bridge, was an important intermediate operation. This involved coupling the individual coils of wire produced at Trenton into continuous wires, and then winding the wires onto the huge reels used by the spinning equipment on the bridge.

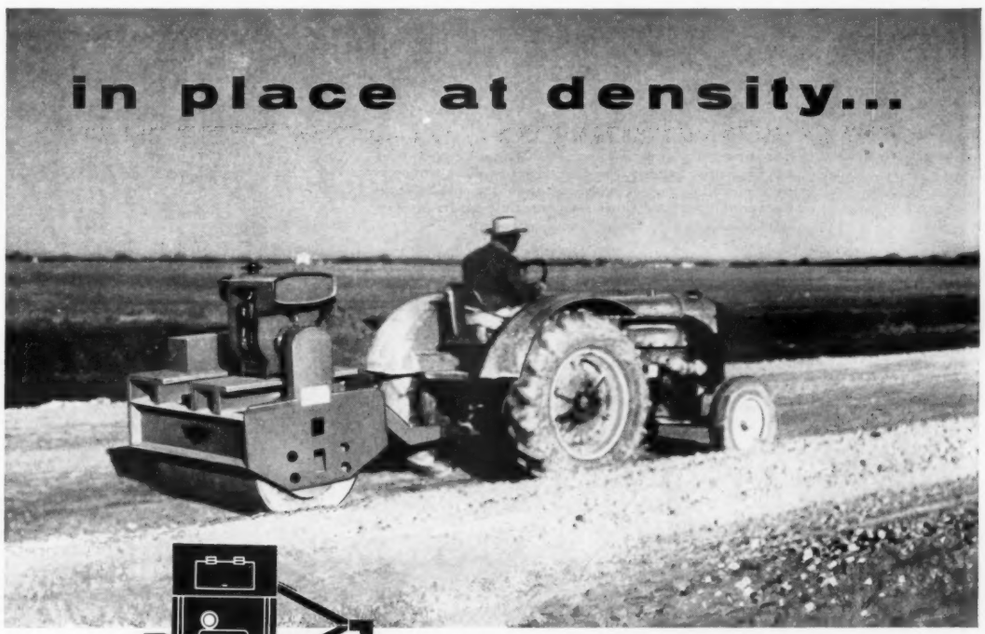
This reeling operation was carried on in a plant setup by American Bridge at the yards of the Straits Engineering Co., in Sault Ste. Marie, Mich., about 50 miles northeast of the bridge site. The reels and reeling equipment at the plant were those built some years ago for a similar operation on the San Francisco-Oakland Bay Bridge. Used on many well known bridges since, the equipment worked most recently on the Walt Whitman Bridge at South Philadelphia, Pa. Work at the plant was supervised by C. N. Haney and field engineer M. D. "Doug" Morehead. This reeling operation—like other American Bridge work on the Mackinac span—was under the over-all supervision of project manager D. C. Kline.

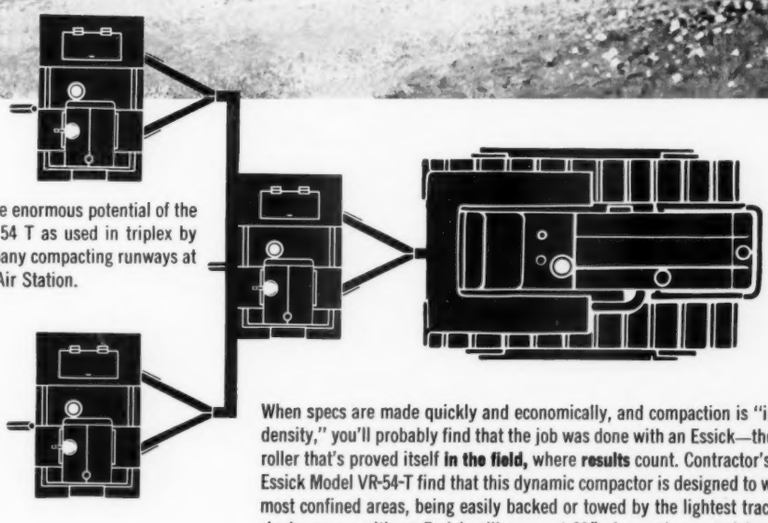
The Vaughn 6-spindle wire-block machine at Trenton drew the special bridge wire in continuous pieces ranging just under 5,000 feet in length and weighing about 475 pounds. These lengths, bound in 5-foot-diameter coils, arrived at the plant site by rail.

**8** The rail car, being loaded by the Manitowoc, holds three of the reels for the journey to St. Ignace. At the dock, the reels will be loaded on barges and towed to cable spinning machinery at the anchorage piers. Empty reels speedily follow the same route back; with only 72 reels on the job, no time is lost in returning the empties to be filled for cable spinning. (See "Straits bridge cables are spun in record time," next page.)

After opening the heavy doors in the roof of the plant, a Manitowoc 3000 crane lifts a full reel from a reeling machine. The full reel will be placed on the ground while the empty, right, is set in place on the reeling machine.

in place at density...





Drawing shows the enormous potential of the Essick Model VR 54 T as used in triplex by S. J. Groves Company compacting runways at Lakehurst Naval Air Station.

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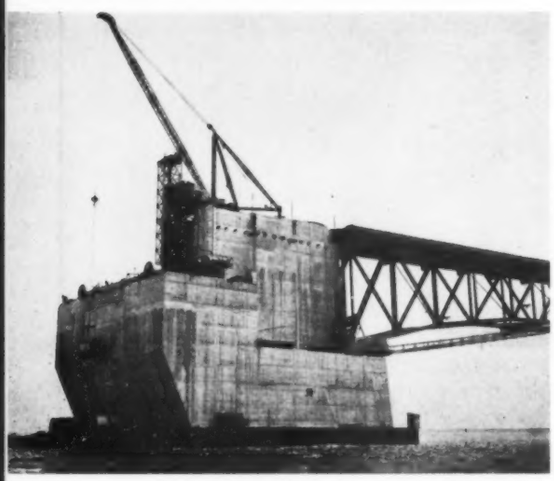
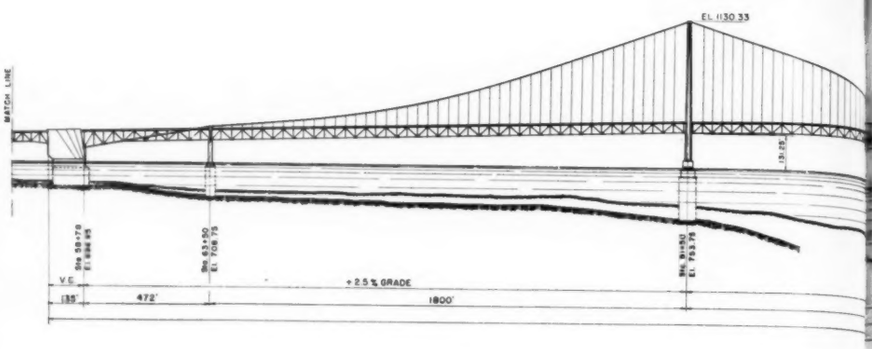
# Straits bridge cable



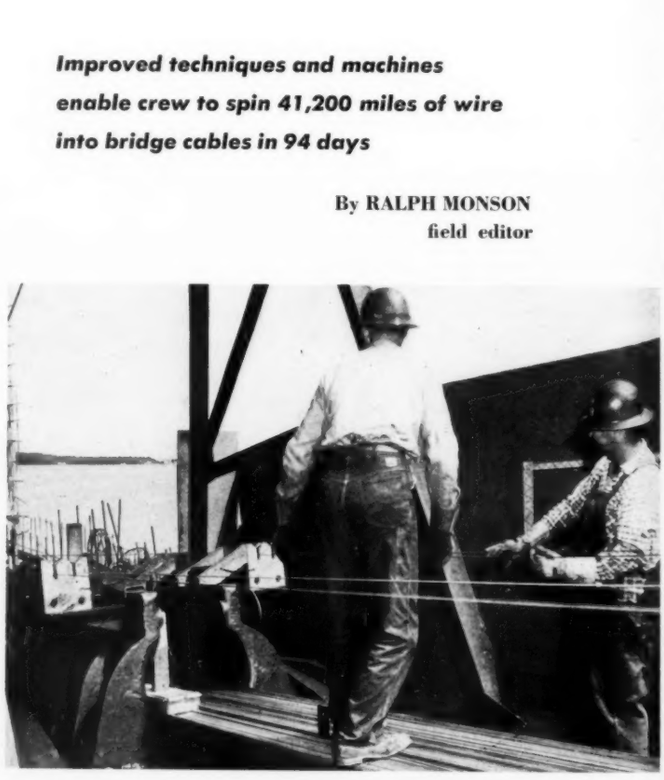
Reels of 0.196-inch wire are lifted from a barge to the reel stand on one of the anchorage piers by an American Bridge 50-ton stiffleg derrick. The catwalk used by the crew adjusting the strands starts at right. Atop the anchorage is the floating sheave tower that keeps tension on the wires.



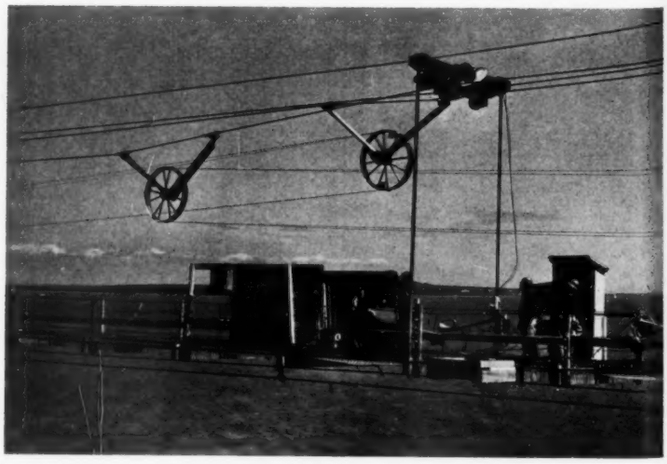

***Improved techniques and machines enable crew to spin 41,200 miles of wire into bridge cables in 94 days***

By RALPH MONSON
field editor

One of the two spinning wheels, which always remain opposite each other on the 18,000-foot-long endless hauling rope, heads toward workmen at the anchorage saddle with a pair of wires. Strands are spread from the saddle to strand shoes on separate eyebars anchoring the cables into the anchorage concrete.

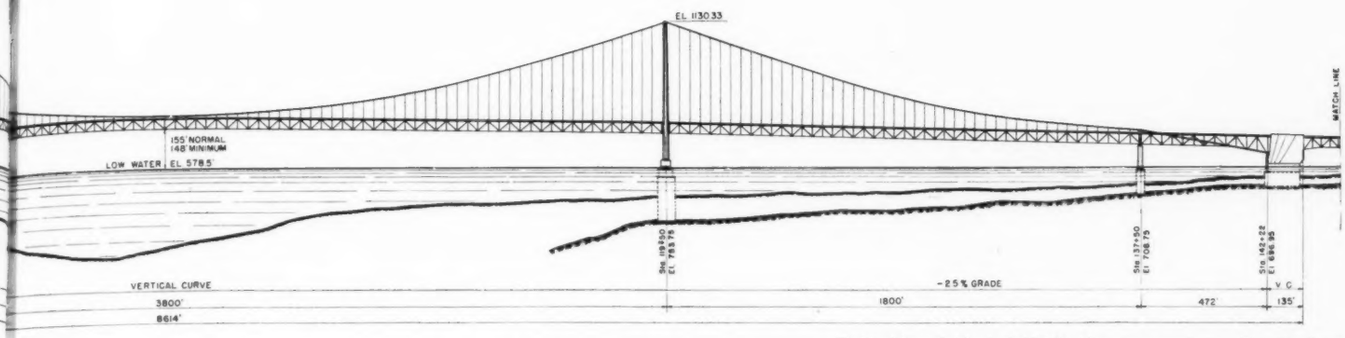


Workmen at the anchorage saddle place the live wires in V-shaped notches that will keep the wires running over a set of sheaves. These wires, to be adjusted as the wheel makes the return trip spinning wires for a separate strand, will then be placed in the strand on which the workman is standing.



As the wheels pass each other at the center of the main span, workmen on the catwalk wait for the wires to drop within their reach. The two dead wires will be adjusted to exact grade when the wheels are out of the span. Live wires will be adjusted when the wheel makes the return trip, spinning another strand.

# ...re spun in record time




Th Mackinac Bridge's 8,614-foot-long suspension section, the longest in the world.

Aerial spinning methods—similar to those used more than 100 years ago when John Roebling spun his first bridge cable at Niagara Falls—were used in spinning 41,200 miles of wire into the two huge cables for the suspension section of the Mackinac Straits Bridge.

But greatly improved machinery and techniques made it possible for the job to be completed in 94 days' time. The 12,580 wires making up the 37 individual strands of each cable were then compacted to a final diameter of 24½ inches by a six-armed hydraulic machine.

Modern spinning wheels each carried four of the 0.196-inch high-tensile galvanized bridge wires on each trip across the Straits, placing the parallel wires up over the main towers from anchorage to anchorage to form the strands that make up the cable. Wires are not braided or twisted during the operation—in fact, every effort is made to keep them as nearly straight and parallel as possible. Since two wheels always worked together—starting from opposite anchorages and passing at the center of the main span—each trip resulted in eight wires being placed. Actual travel time for a trip was about 17 minutes.

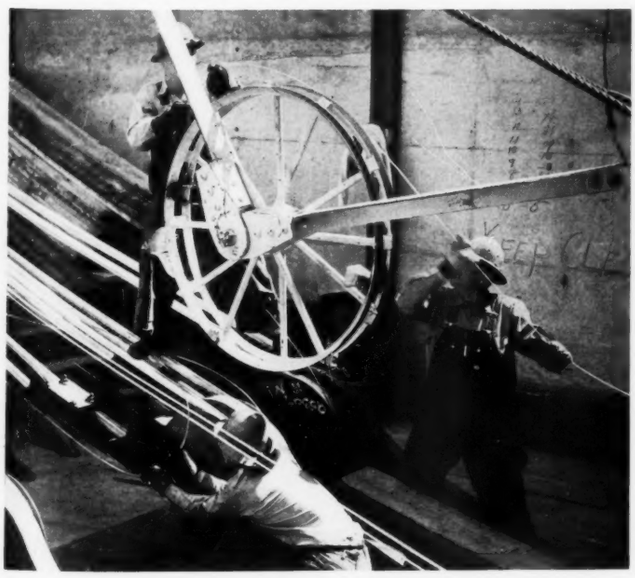
**Suspension section**

The Mackinac Straits suspension bridge is unusual in that while there are actually five cable spans and six piers, the cables support the roadway in only three of the five spans. The 8,614-foot suspension portion of the bridge stands near the middle of the 4-mile-wide Straits. Its 3,800-foot main span goes across a wide, deep gorge. A series of approach trusses on each side extend from the ends of the suspension bridge to each shore.

At each end of the suspension bridge is a huge concrete anchorage pier, keyed into the rock bottom of the straits and rising 118 feet above the water to meet the bridge roadway. On a bench on each side of this pier is a cluster of heavy eyebars through which the individual strands

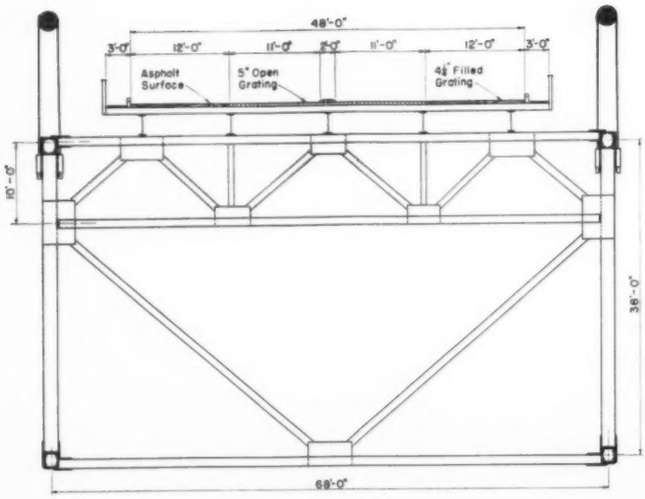
*(Continued on next page)*

After the 340 wires in a strand are adjusted to grade, the strand is squeezed into a round shape with squeezing tongs. Light metal bands, placed around the strand, will hold it temporarily. In this steep section of the woven wire and timber catwalk, cleats are provided so that workmen will not slip.



As the spinning wheel arrives home at an anchorage, workmen spring into action to place a new pair of wires for the return trip. The third man is getting ready to place wire from the wheel on a strand shoe. Cow bells on the wheel warn workmen on the catwalk of the wheel's approach.

(Continued from preceding page)




◄ Cross section of Mackinac Straits bridge.

of the cable are anchored into the pier. The center of these anchorages is about 35 feet above the water or 30 feet below the bridge roadway.

Spaced 3,800 feet apart at the center of the suspension bridge are the two steel towers that rise 552 feet above the water and have footings more than 200 feet below the water in the rock bottom of the Straits. Between the anchorage and the tower on each side is a pier known as a cable bent pier.

The bridge cables leave the anchorages through splay saddles and rise to roadway grade at the top of the cable bent piers, 472 feet away. Then they continue their climb through an 1,800-foot span to the tops of the 552-foot towers. They will hang between the towers in a graceful catenary during the spinning process and will form a parabolic curve when the dead load is applied. The roadway in the center span and in the two 1,800-foot side spans is supported by the cables by means of hangers. Independent trusses support the roadway in the 472-foot spans between the anchorages and the cable bent piers.

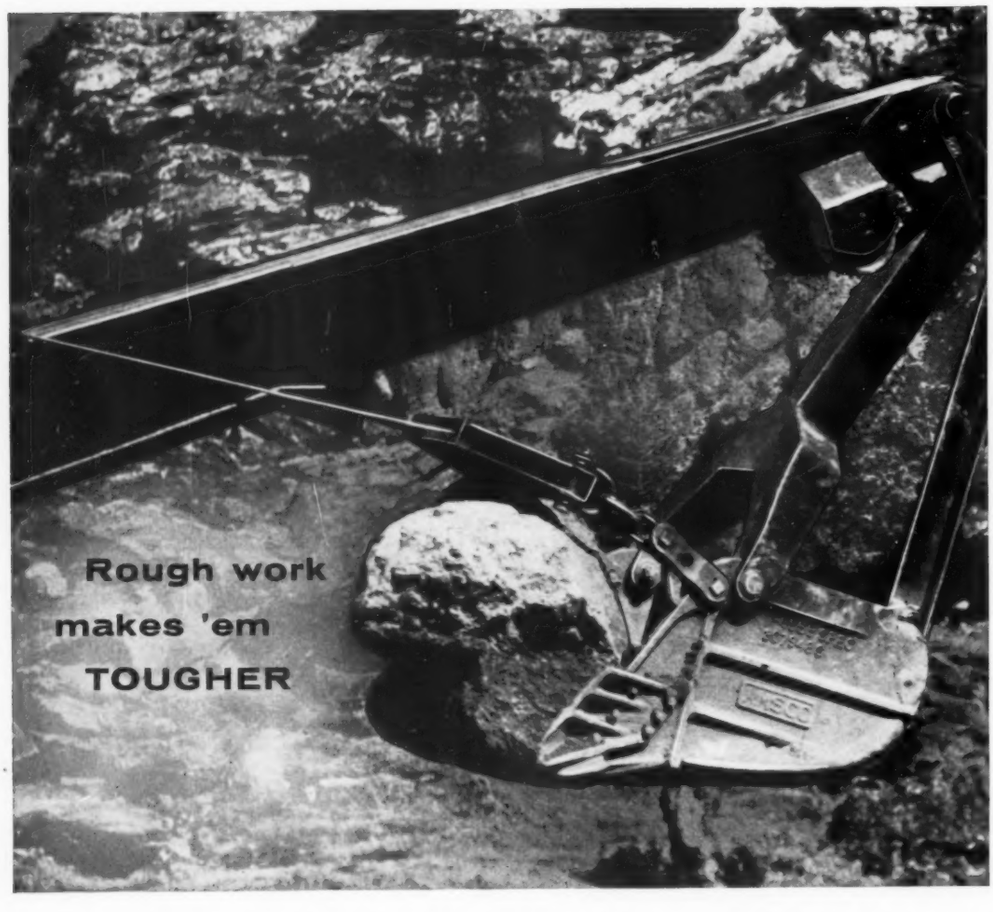
### Work from catwalk

Before the spinning operation could begin, it was necessary to build a catwalk that followed the path of each of the cables, permitting workmen to take up positions along the route and handle wires as they were spun. Each of these catwalks was supported on five 2¼-inch special galvanized bridge ropes, which were later taken down and returned to the factory to be cut into the proper lengths for the suspenders of the bridge and fitted with sockets.

These special galvanized bridge ropes were shipped to the bridge site on large wood reels and socketed at lengths that fit exactly in all spans between the towers, cable bents, and anchorages. As they were strung from pier to pier by a laying barge, derricks on top of the piers picked the cables up, one by one, and hoisted them to the tops of the piers or towers, where they were locked securely in place by sockets. Wire rope stays tied the cables back to the bottoms of the piers to steady the catwalks against wind-induced motion and hold them to the shape of the finished bridge cable.

The timber and woven wire-fabric decking for each catwalk was placed as soon as the ropes were in place. This decking was assembled in 100-foot sections, which were hoisted to the tops of the towers and slid down the catwalk ropes to their proper place. The 11-foot 6×8 timbers were attached by clamps at 10-foot spacings to the under side of each of the five ropes for each catwalk. Ropes were spread so that two of them were near either end of a timber and the fifth was in the center of the timber.

At each end of the floor timbers, 3×4 railing posts were bolted in an upright position to support a ½-inch wire-rope handrail and two intermediate rails consisting of No. 6 galvanized wires. A narrow strip of hardware cloth was attached to the bottom of the rail posts to form a kick plate. Wires for lighting and signal circuits were attached to the outside of the railing posts. Two 1-inch wire ropes called tramway support ropes were hung above the catwalk from frames spaced at intervals of about 200 feet between the piers. These ropes carried 8-inch pipe spreaders, to which the hauling rope of the spinning equipment was attached. With the catwalk in place, it was possible for men to walk to their stations along the bridge from either anchorage.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Mackinac Bridge Statistics

Designer:
D. B. Steinman
New York City

Substructure work:
Merritt-Chapman & Scott
New York City

Superstructure work:
American Bridge Division
U. S. Steel Corp.
Pittsburgh, Pa.

| | |
|---|---|
| Cost | $96 million |
| Concrete | 920,600 tons |
| Structural steel | 55,600 tons |
| Steel cables | 11,000 tons |
| Length | 17,913 ft. |
| (3.4 miles plus approaches) | |
| Suspension length | 8,614 ft. |
| Main span | 3,800 ft. |
| Clearance above water | 155 ft. |
| Number of cables | 2 |
| Strands per cable | 37 |
| Wires per strand | 340 |
| Total wires | 41,200 miles |

### Spinning the cables

Cable spinning began at the reel stands, which were located on platforms on the anchorages, about 90 feet above water. Each reel stand had mountings for eight of the big wire reels. These reels hold about 16 tons, or about 320,000 feet of wire, and weigh 2½ tons when empty. (See "Reeling plant transfers coils of wire to reels for Mackinac Straits span," pg. 68.) An American Bridge 50-ton stiffleg derrick, mounted on the top of each anchorage pier, hoisted full reels from barges to the stands and returned empties to the barges. These derricks were operated by Clyde hoists with three main drums plus swingers. Caterpillar engines powered the hoists.

Wire was fed from the reel stand through a floating sheave tower, which maintained a uniform tension on the wire during acceleration and deceleration of the spinning wheels. The wire ran over the sheaves in the top of the tower, then around the floating sheaves that traveled up and down in the tower. The floating sheaves were counterweighted with a cable that ran over the side of the pier to a box of heavy anchor chain. As the sheaves rose in the tower, they picked up an additional length of the anchor chain, thus increasing the tension on the wire. This helped to get the wire reel turning during acceleration of the spinning wheel.

When the wheel stopped suddenly, the floating sheaves dropped in the tower and absorbed the momentum of the wire reel. The lowering of the floating sheave also applied the brake to the reel, bringing it to a smooth, quick stop.

### Spinning wheels

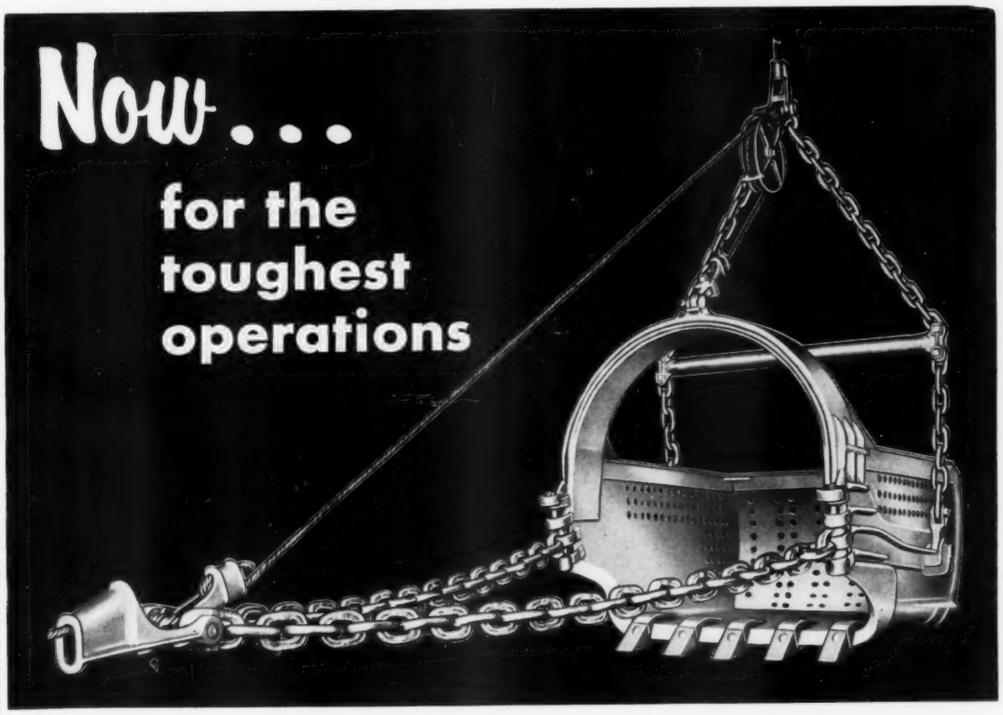
The spinning wheel is simply a device that pulls the wire up over the towers from one anchorage to another. On the Mackinac bridge, the spinning wheel was actually two 4-foot-diameter wheels with grooved rims that were mounted on a common axle. The axle was supported on a V-shaped frame attached permanently to a hauling rope. The frame was suspended from the hauling rope by offset brackets, which permitted the rope to pass over the supporting sheaves while the spinning wheel passed beside them.

Ordinary cow bells, attached to the rims of the spinning wheels, tinkled continuously as the wheels traveled. This warned workmen to keep out of the way of the approaching wheels and insured that they were ready to handle the wires as they arrived.

The hauling rope, 18,000 feet long, was an endless ⅞-inch preformed 6×19 Type N wire rope manufactured by the American Steel Wire Division of U. S. Steel. It extended from one anchorage to another, running up

(*Continued on next page*)

Spanning 3,800 feet between the 552-foot-high main towers are the catwalks used by crews adjusting strands to grade for the suspension portion of the Mackinac Straits Bridge.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Designed to meet the problem of rising stripping costs, the new Type "MH" Hendrix is engineered and built to take the abuse of the most rugged stripping conditions. Like all other Hendrix Buckets, the Type "MH" assures GREATER PRODUCTION at the lowest cost-per-yard for MORE PROFITS on every job.

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

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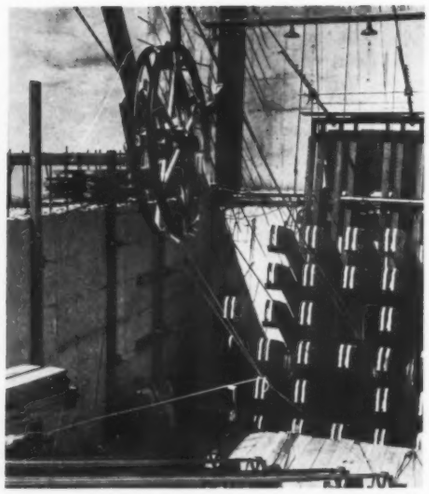

After the spinning wheel leaves the anchorage, dead wires from the bottom are picked up by a long hooked rod and placed in the strand being spun. These wires are adjusted as the wheel makes the trip across, the work starting as soon as a wheel is out of a span.

and over the cable bents and main towers as it followed one edge of the catwalk to one shore and the other edge back to the other shore. At each pier, and at intermediate points about 200 feet apart, the hauling rope was supported on frames carried by the tramway support ropes.

At each anchorage, the hauling rope passed through an American Hoist & Derrick spinning machine—essentially a 7-foot-diameter, reversible drive-wheel powered through a torque converter by a Caterpillar D337 engine. Both these spinning machines were synchronized automatically, permitting one operator in the north anchorage to use one set of controls for both machines.

Two spinning wheels were attached to opposite sides of the hauling rope loop so that they left opposite anchorages at the same time, passed each other at the center of the main span, and ended a trip at opposing anchorages. After each crossing had been made, the drive wheels of the spinning machines were reversed and the spinning wheels returned over the same route.

The usual travel speed of the spinning wheels was 700 feet per minute. The powerful spinning machines could accelerate the wheels to this speed from a dead stop in 40 seconds. And because of the smooth working combination of floating sheaves and wire reel brakes, the wheels could be brought to a smooth stop in only a few feet of travel, even when they were moving at a rate of 700 feet per minute.

### Spin four strands in setup

Each strand in a cable contains 340 wires and four strands were spun in one continuous operation called a setup. Nine of these setups produced 36 strands in one cable, and the single strand needed to complete a 37-strand cable was spun as a separate setup. Immediately after one setup had been completed—or when four strands had been spun—spinning operations were shifted to the other cable so that adjusting crews could bring the completed strands to exact grade.

A strand was started as one end of the wire was passed from one of the wire reels through the floating sheave tower and down to the working platform at the anchorage eyebars. This wire, passed around one of the strand shoes, was anchored to become the first dead wire of that strand. Two of these wires were placed in the grooves of one of the spinning wheels for the start of the spinning operation.

As the wheel moved across the span, two dead, or non-moving wires were laid down off the bottom of the wheel. These were placed in the strand clamps by workmen at the pier saddles and adjusted to grade immediately.

The two live or moving wires left behind were placed in guides on sheaves so that they were held in position while they were being pulled across the saddles.

When the wheel arrived at the opposite anchorage, workmen took the two loops off the spinning wheel and placed them over the proper strand shoes.

On this trip, the wheel placed four wires—two live and two dead—in strand 1. On the return trip, it pulled four wires into strand 2. The second wheel, which always remained opposite to the first spinning wheel on the endless hauling rope, meanwhile has spun four wires for each of the two other strands. In approximately the half hour it took for a spinning wheel to make a complete round trip, four wires were placed in each of the four strands being spun.

Throughout the spinning operation,

(Continued on page 76)


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- 11 Wheels
- 88" Rolling Width
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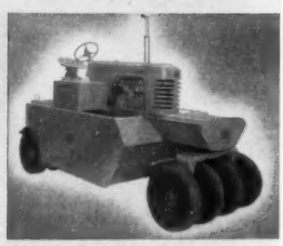

TAMPO MANUFACTURING COMPANY

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*See the new Tampo SP-11S on display at the ARBA Road Show—Booth #324 Section A, North Hall, Second Floor.

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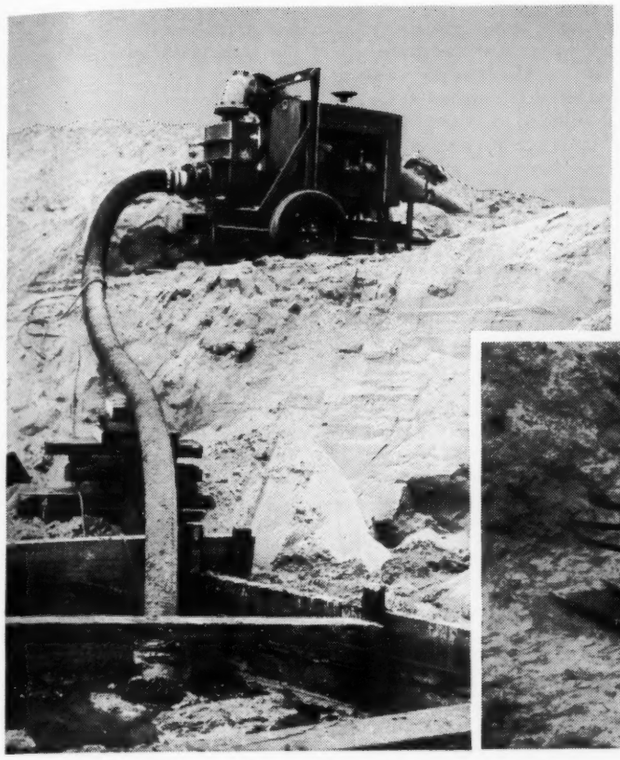

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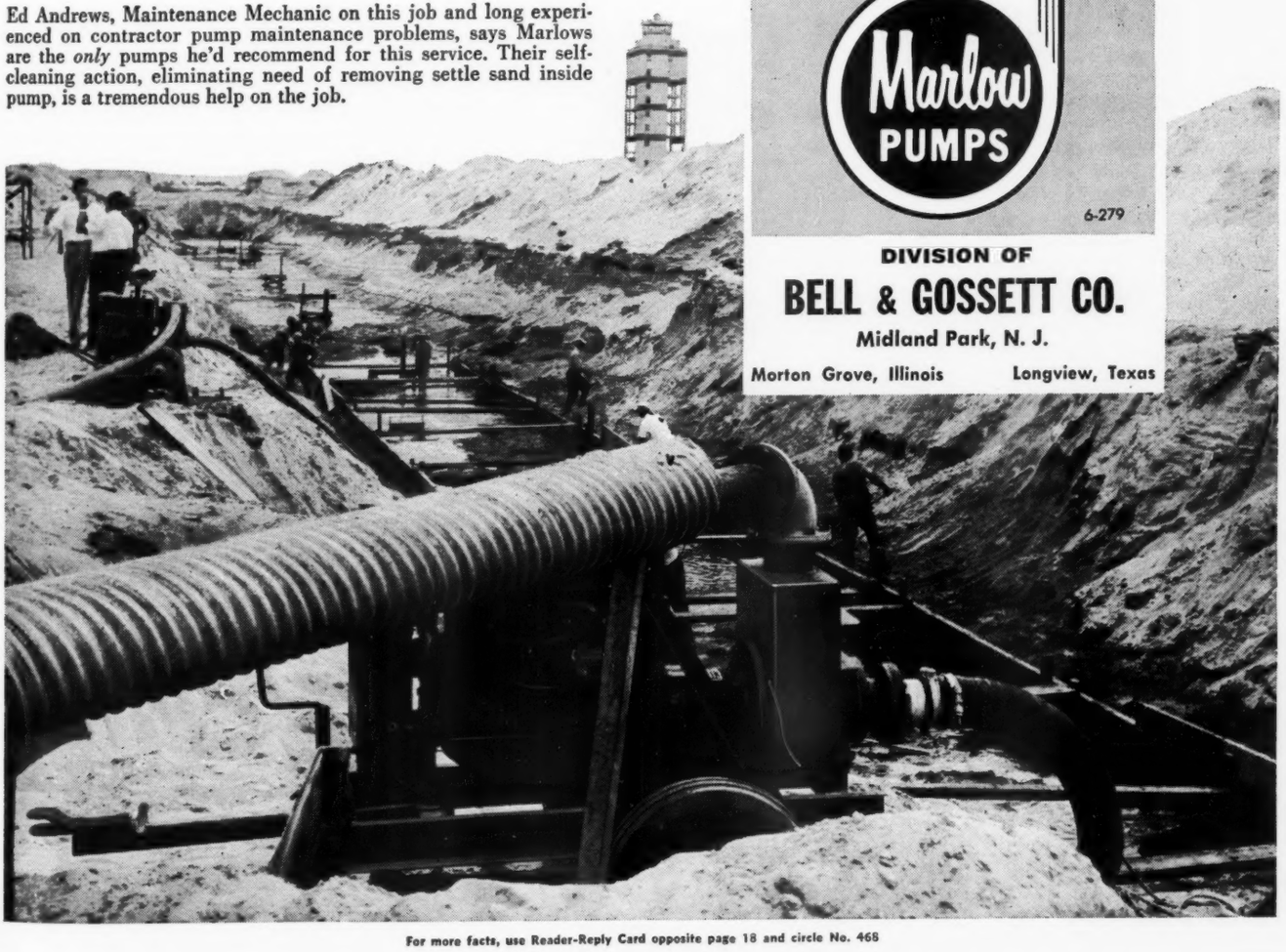
The location's sandy soil is easy to dig but also offers potential trouble because of abrasive sand in underground water. However, because Marlow pumps are easily returned to full factory efficiency by replacing just two simple parts, they have been extremely valuable on this job.

Part of the New York International Airport's $90,000,000 "Terminal City" development involves a $4,300,000 underground piping program by the Foundation Company for heating and ventilating.

Ed Andrews, Maintenance Mechanic on this job and long experienced on contractor pump maintenance problems, says Marlows are the *only* pumps he'd recommend for this service. Their self-cleaning action, eliminating need of removing settle sand inside pump, is a tremendous help on the job.



Marlow PUMPS

6-279

DIVISION OF

**BELL & GOSSETT CO.**

Midland Park, N. J.

Morton Grove, Illinois  Longview, Texas

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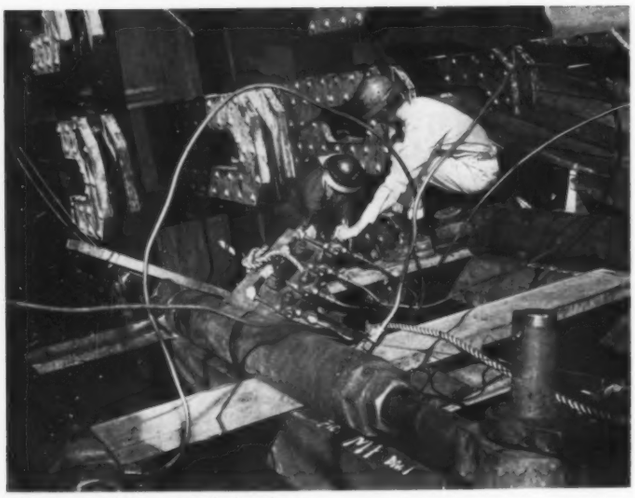


After a set of four strands has been spun, a workman uses one of the 70-ton pulling jacks to take up one of the strands being adjusted to proper grade.

(*Continued from page 74*)

halts made while wire was spliced together took up a minimum of time. About ten reels—each of them containing about 320,000 linear feet of wire—were needed for each strand, which was spun as a continuous piece. As the spinning wheels stopped so that the last wrap from one reel could be spliced to the wire on the next full reel, the reel-changing crew lost no time in fitting the ends together and tightening the threaded splicing device.

#### Elaborate signal system

The adjustment of each wire of a strand to an exact, predetermined grade, an operation closely coordinated with the spinning of the strands, was done with the help of an elaborate system of signals that provided fast communication between workmen and a foolproof system for starting and stopping the wheels.

A switch at any one of 23 stations could stop the wheels, but only the spinning machine operator was able to start them again. And he could only start the wheels when the switches at all stations were in the "on" position.

This placed the wheels always under the control of stations from which the wheels could be seen. The spinning machine operator was also able to stop the wheel, but seldom did so. Two Murphy diesel engines driving 75-kva EM generators powered the signal systems and provided power needed to light the entire work area at night.

#### Each wire adjusted

The adjusting operation was coordinated with the spinning of the wires. Each wire of a strand must be adjusted to an exact, predetermined grade. Later, each strand had to be adjusted to its proper place in the cable.

Before spinning started, a single wire was strung from anchorage to anchorage over the exact path the cable was to take. This wire was set to an exact grade at the center of each span, as determined by a very accurate survey. As the first four strands were spun, each wire was adjusted to a predetermined elevation as related to the original grade wire.

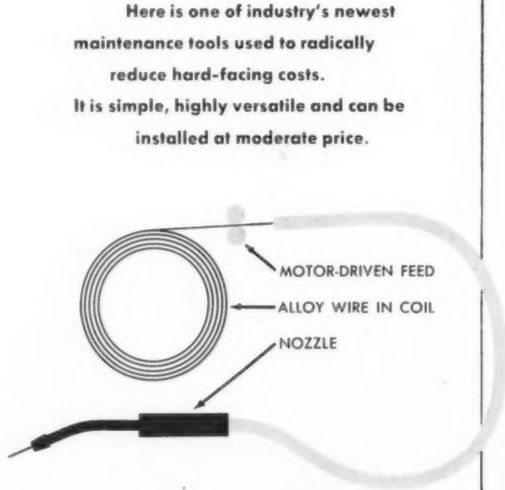
This job was done by workmen, called adjusters, stationed on the catwalk at the center of each of the five spans. A winch at each pier operated an Ohio Gear Co. winch, while a dog-off man handled the clamps used to pull or hold the wires in place. The Ohio Gear Co. winches at the main towers, rated at a line pull of 1,000 pounds, were powered by General Electric 2-hp motors. Winches at cable bents and anchorages had a 700-pound line pull and were driven by General Electric 1½-hp motors. As soon as the spinning wheel had passed the cable bent pier, completing the first span of the cable, the saddleman at this pier placed the two dead wires in the saddle. The adjuster then signaled the winchman, telling him how much to take up or let off on the wires.

When the wires had been pulled to exact grade, the adjuster signalled the dog-off man to clamp them in place. The adjustment complete in one span, the signal was passed ahead to the crew members in the next span to start adjustment as soon as the spinning wheel was out of their span. This operation followed the wheel across the bridge, the two dead wires being completely adjusted shortly after the wheel completed its trip.

The two live wires strung on that trip for one strand were then adjusted in a similar operation that was completed while the wheel was mak-


# WHAT IS *SEMI-AUTOMATIC* HARD-FACING?

**Here is one of industry's newest maintenance tools used to radically reduce hard-facing costs. It is simple, highly versatile and can be installed at moderate price.**




Semi-automatic hard-facing is a process which combines the high deposit rates of automatic welding with the positioning and setup convenience of the manual method. It utilizes a complete series of Stoody fabricated tubular wires containing alloys that meet all hard-facing requirements. These wires, supplied in layer wound coils, are mechanically fed to the nozzle by the semi-automatic welding machine. The weldor merely directs the arc as the metal is deposited on the work, the machine automatically starting the wire feed when the arc is struck, stopping it when the arc is broken. Numerous advantages result when rebuilding and maintaining equipment in all types of heavy industry.

*Repointer welded on with Stoody Nickel Manganese and entire tooth hard-faced with Stoody 121*

*Roll brought up to size with Stoody Nickel Manganese and corrugations rebuilt with Stoody 100*

ing a return trip with four wires for another strand. Since the spinning wheel could not start another trip until the wires in the first strand had been adjusted, crews kept working over and back as a team to get all four wires adjusted before the wheel was ready to start again on that strand.

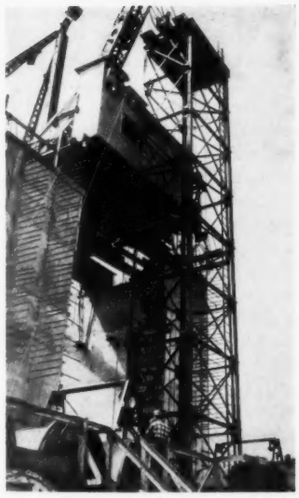
### Strand adjusting

After the first four strands of each cable had been spun to previously set grade wires, they were resurveyed, and adjusted to exact grade. The next four strands were then spun a few inches above them. In this way, the second four strands were separated from the first four and adjustment of the individual wires was made easier. When this next setup of four strands had been completed, they were lowered into the final position in the cable by an adjusting process handled at the anchorage piers.

At each anchorage, each strand was attached to two strand shoes which were attached by a large pin to a heavy eyebar known as the adjusting link. The other end of the eyebar was held by a pin that passed through long slotted holes in a structural steel member known as an anchor bar. The anchor bar was attached to the anchor girders, which were encased in the concrete of the huge anchorage pier.

The slotted holes in the anchor bars made it possible for the individual strands to be adjusted. When spinning started, the eyebar pin was set at the back of the slotted hole, and the space in front of the pin filled with steel shims. When the strand had been spun some of these shims were removed to drop the strand into its proper position in the cable. A special crew with highly specialized equipment did this adjusting operation.

The primary tools of the adjusting crew were 70-ton hydraulic pulling jacks, which had their pull practically doubled by a two-part arrangement. Jacks were reeved with two parts of 1¾-inch cable so that pull was exerted from both ends of the jack. The cable from the back end of the jack passed over a heavy sheave in the anchor bar and then back up to the front of the adjusting link, over the end of the adjusting link, and back to the pulling jack. Hydraulic pressure was provided to the jacks by a Watson-Stillman air-operated hydraulic pump powered by a Chicago Pneumatic 315-cfm compressor.



Wire coming off the reels, lower left, passes over stationary sheaves and down around floating sheaves that ride up and down in the tower. Counterweighted with anchor chain, they take up the shock when the spinning wheels start or stop.

The ratio of the longitudinal movement of the eyebar pin to the lowering of the cable strand at the center of each span had been computed previously by engineers, and when the adjuster determined how much the strand would have to be lowered at the center of each span, the adjusting crew was able to compute the length of strand to be passed over each support.

Strand adjustment for the main span, north side span, and north backstay spans was made from the north anchorage. The other two spans were adjusted from the south anchorage. In the first step, enough shim had to be removed to provide the adjustment in the main span. Cable was allowed to slide through the saddles on the anchorage, cable bent pier, and north tower until the adjustment was complete.

Next, the proper amount of shim was removed to adjust the side span cable between the north tower and the north cable bent. This cable slid through the saddles on the anchorage and cable bent. The process was repeated to adjust the strand in the backstay span between the cable bent and the north anchorage. When this cable had been passed through the anchorage saddle, its weight held it in position.

In order to minimize the effects of sunshine and temperature variations on the strands, final adjustments were made between 2 and 3 a.m., after the entire strand had cooled to a uniform temperature that was equal to that of strands already adjusted.

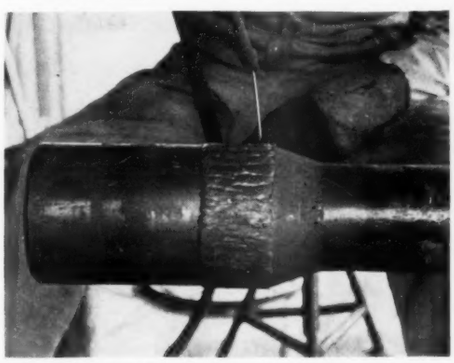
When the bridge is substantially completed and the dead load placed on the cables, the eyebars and the anchor bars will be encased in concrete right up to the strand shoes.

### Strands are tied

As each strand was completed, the wires were squeezed together with a strand-squeezing tongs and tied at

*Shovel track pads rebuilt with Stoody Nickel Manganese*

*Mill hammers brought up to size with Stoody Nickel Manganese, using copper form, then hard-faced with Stoody 100*



*Tool joints hard-faced with Stoody 130 or Stoody 100*

**HIGH WELDING SPEEDS**—Two to four times faster than the manual method at correct welding amperages, semi-automatic hard-facing effects enormous savings in time. Penetration of the base metal and dilution of the deposit are reduced, with lower heat input, all highly desirable features of this process.

**FULL VISIBILITY**—No submerging flux is required; the weldor enjoys complete visibility of the weld at all times. Flux dams are unnecessary.

**NO STUB END LOSSES**—Wires are supplied in continuous coils. There is no stub end waste nor time lost in changing electrodes.

**SEMI-AUTOMATIC MACHINES**—Now supplied by a number of manufacturers, all can be used satisfactorily with Stoody semi-automatic wires with minor conversions consisting of wire guides, nozzle and nozzle tip. Conversion kits are available from all Stoody distributors.

**WHERE CAN SEMI-AUTOMATIC HARD-FACING BE ECONOMICALLY USED?**—In general, almost any work now hard-faced manually can be completed faster and cheaper semi-automatically with deposits having wear resistance usually superior to manual electrodes of similar analysis. The illustrations are typical of current semi-automatic applications.

Write for circular. Contains a full description of present Stoody semi-automatic wires and typical applications.
Available from your Stoody dealer.
Check the "Yellow Pages" of your phone book or write direct.

*Dredge pump casing hard-faced with a combination of Stoody 121 and Stoody 100*

**STOODY COMPANY**
11936 EAST SLAUSON AVENUE
WHITTIER, CALIFORNIA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 469

10-foot intervals with metal bands. On the anchorage splay seizing, between the anchorage saddle and the strand shoes, the strands were tied with Band-It stainless steel clamps. Lightweight tinned clamps, used on the remainder of the strand, pulled it into a circular shape.

When all strands had been spun for a cable, they were compacted by a hydraulic machine consisting of three pairs of hydraulic jacks arranged in a hexagonal frame around the cable. Opposing pairs of jacks, connected to the same pressure hoses, had pressure between them equalized.

This machine brought the cross section of the cable into a circular shape, while the individual strands were squeezed into a shape that was roughly hexagonal. During the compaction process, the light ties holding the strands together were broken, and ties on the outside were removed. New ties were then placed around the entire cable at 2 to 3-foot intervals. These temporary ties will hold the cable together until the saddles for the suspenders are mounted. Red lead paste was applied to the cable, and a permanent wrapping of No. 9 wire made, after the suspended spans were completed.

With the opening of the 1957 construction season, the attachment of suspender cables will begin, to be followed by the erection of the stiffening trusses. By November, 1957, when the bridge is scheduled to be opened to traffic, only such work as the wrapping of the cables and the completion of painting will remain to be done.

D. C. "Dan" Kline, project manager for the American Bridge Division's cable-spinning operations, relaxes on the deck of a personnel boat after returning from an inspecion trip.

**Personnel**

Approximately 360 workmen on the American Bridge Division crews kept the spinning operation going 15 hours per day, six days a week, to complete their job in about three months. The superintendent of the suspension portion of the project for American Bridge was A. B. "Art" Drilling. His first assistant was D. B. "Dave" Rees, senior field engineer on this portion of the work. Over-all supervision of the project was handled by D. C. Kline.

The Mackinac Straits Bridge was designed by D. B. Steinman, New York City, and the Steinman organization is supervising all of the construction activities in the field. Resident engineer on the project representing Dr. Steinman is J. W. Kinney. Chairman of the Mackinac Bridge Authority is Prentiss M. Brown. THE END

*Additional articles on the Mackinac project appear on pages 94 and 102 of this issue.*

## Truck "hospital" opened in New York by Mack Trucks

Mack Trucks, Inc., of Plainfield, N. J., has opened a truck "hospital" in New York City. The new Mack Manhattan Sales and Service Center, located at 625 W. 42nd St., is geared to service and repair more than 50 trucks of any make at one time.

Repair area in the new structure exceeds 30,000 square feet without a single post to impede the traffic flow. Departments included in the building are a truck get-ready, machine shop, unit repair, general service, parts and warehousing, electrical repair, lubrication, used truck reconditioning, and welding. Around-the-clock one-stop operation will also be provided in the center. Tools and testing machinery of the latest type will permit both gasoline and diesel engine servicing, stand-by exchange units will be available for ready installation, and a dynamometer will make 35 essential performance checks in a matter of minutes.

Still in the blueprint stage is an electronic tower to speed the job of shifting the big trucks on and off the work tables. Through an intricate internal communications system, the tower will time all jobs in the center for maximum utilization of all repair facilities.

Manager of the center is Jack Connor, and James Atkins is service manager.

## Front-end loaders

■ The design and construction of Caterpillar's three Traxcavators—No. 933, No. 955, and No. 977—are explained in a booklet from the company. Stability, bucket capacity, power, and speed are discussed in relation to their effect on profit. On-the-job photos show various uses of the units.

To obtain Form 32024 write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 186.

# Now . . . most power of the low-priced 3

# New DODGE *PowerGiants*

## 1957 line-up gives you up to 232 hp.

Dodge tops the low-priced field in V-8 power by a big margin—actually delivers as much as *31% more!* This *extra* power in reserve saves engine strain . . . wear . . . excessive repairs. What's more, Dodge V-8's use *regular* gas, help keep your cost per ton-mile *down!*

**Extra payload capacity.** You can haul more—up to 73% more in the 300 model pick-up, for example.

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See the new *Power Giant* line-up now at your Dodge dealer's. You'll see features that prove it pays to get your Dodge dealer's deal before you decide on *any* truck.

**Available on all low-tonnage and Forward-Control models.*

**DODGE meets your hauling needs!**

| Conv. Models | Max. G.V.W. | Max. G.C.W. | Max. V-8 HP. |
|---|---|---|---|
| 100 | 5,100 lbs. | — | 204 |
| 200 | 7,500 lbs. | — | 204 |
| 300 | 8,800 lbs. | — | 204 |
| 400 | 15,000 lbs. | 26,000 lbs. | 197 |
| 500 | 18,000 lbs. | 32,000 lbs. | 197 |
| 600 | 21,000 lbs. | 35,000 lbs. | 197 |
| 700 | 23,000 lbs. | 45,000 lbs. | 216 |
| 800 | 25,000 lbs. | 55,000 lbs. | 222 |
| 900 | 30,000 lbs. | 65,000 lbs. | 232 |
| **Forward-Control Models** | | | |
| P300 | 9,000 lbs. | — | 204 |
| P500 | 15,000 lbs. | — | 204 |
| **C.O.E. Models** | | | |
| C500 | 18,000 lbs. | 32,000 lbs. | 197 |
| C600 | 21,000 lbs. | 35,000 lbs. | 197 |
| C700 | 22,500 lbs. | 45,000 lbs. | 216 |
| **Tandem Models** | | | |
| T700 | 32,000 lbs. | 45,000 lbs. | 216 |
| T800 | 36,000 lbs. | 55,000 lbs. | 222 |
| T900 | 46,000 lbs. | 65,000 lbs. | 232 |

# DODGE TRUCKS

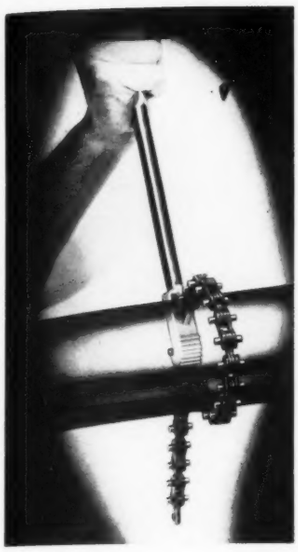
WITH THE *FORWARD* LOOK

Pick-ups

Stakes

Tractors

For more facts, use Reader-Reply Card opposite page 18 and circle No. 470



The Morse WC-522 wrench chain has a natural flexibility that enables it to grip securely an object of any shape without marring its surface.

## Wrench chain provides positive locking action

■ A new chain for use in applications where strength in tension, flexibility, and quick changes in chain wrap are necessary is announced by the Morse Chain Co. The WC-522 wrench chain has a natural flexibility that enables it to grip an object of any shape firmly without marring its surface.

The new chain is ⅝ inch in pitch. Its average ultimate strength is 7,400 pounds. The width over the plates is .33 inch; the pin diameter is .2 inch. Both pins and plates are made of hardened alloy steel.

The chain is supplied in the specific pitch length requested. A loose-fit connecting pin is furnished for quick assembly.

For further information write to the Morse Chain Co., Industrial Sales Division, Ithaca, N. Y., or use the Request Card at page 18. Circle No. 195.

## Guardrail, piping, forms

■ The company's complete line of products for the heavy construction industry is described in a new bulletin from United Steel Fabricators, Inc. USF guardrail, bridge flooring, steel forms for bridge decking, corrugated metal pipe and pipe arch, steel buildings including USF T-hangars, and AmBridge sectional plate are fully illustrated and described.

To obtain this bulletin write to United Steel Fabricators, Inc., Gasche St., Wooster, Ohio, or use the Request Card at page 18. Circle No. 16.

## Mass. Turnpike to open soon

May 1 is the tentative date when the 124-mile Massachusetts Turnpike will be opened to toll-paying traffic. Originally scheduled for November 15 of last year, adverse weather and the shortage of cement and steel prevented the turnpike from being opened then. This plus the fact that an occasional absence of a stretch of paving, a bridge, an interchange, which would jeopardize the safety of those traveling on the road, made the turnpike authority postpone the opening.

A 30 TO 35-FOOT LAYER of rocky overburden, including a 12 to 14-foot slab of solid blue granite sandstone from which rocks up to 25 tons and more were produced by blasting, was efficiently and economically removed by a Lima 2400 shovel equipped with a National Supply Co. single-stage torque converter in an operation near Jasper, Ala., recently. According to the company, the Lima 2400 —with a 5½-cubic-yard dipper, a 52-foot boom, and a 45-foot dipper stick—accomplished its task at the rate of up to 4,000 cubic yards per day. With its National torque converter, the company reports, the shovel was able to operate at maximum efficiency under extremely difficult conditions. For more information on the torque converter write to the **National Supply Co.**, Two Gateway Center, Pittsburgh, Pa., or use the Request Card at page 18. Circle No. 161.

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The NEW WILLIAMS LLDH DIGGER featuring air actuated clutches, telescoping kelly bar and hydraulic crowd to full depth, PLUS, the same quality, dependability, and overall ruggedness as characterizes all Williams equipment.

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Operations on the 258 miles of road were similar in all five districts last summer. After the old surface had been scarified to a minimum depth of 4 inches, the material is crushed by a power-driven pulverizer pulled by an Allis-Chalmers tractor.

# Salt stabilization cuts cost, maintenance of Ohio roads

***Method used on 258 miles of low-type state roads this year; work is first part of program to improve 850 miles of roadway***

Salt stabilization of 258 miles of low-type state roads in Ohio this summer marks the start of a program that will solve two problems for the state.

First of all, this low-cost method of building a low-type state road will make it possible for Ohio to complete stage construction of its remaining 850 miles of similar roads in the state system. This will be done at a rate of 250 miles per year.

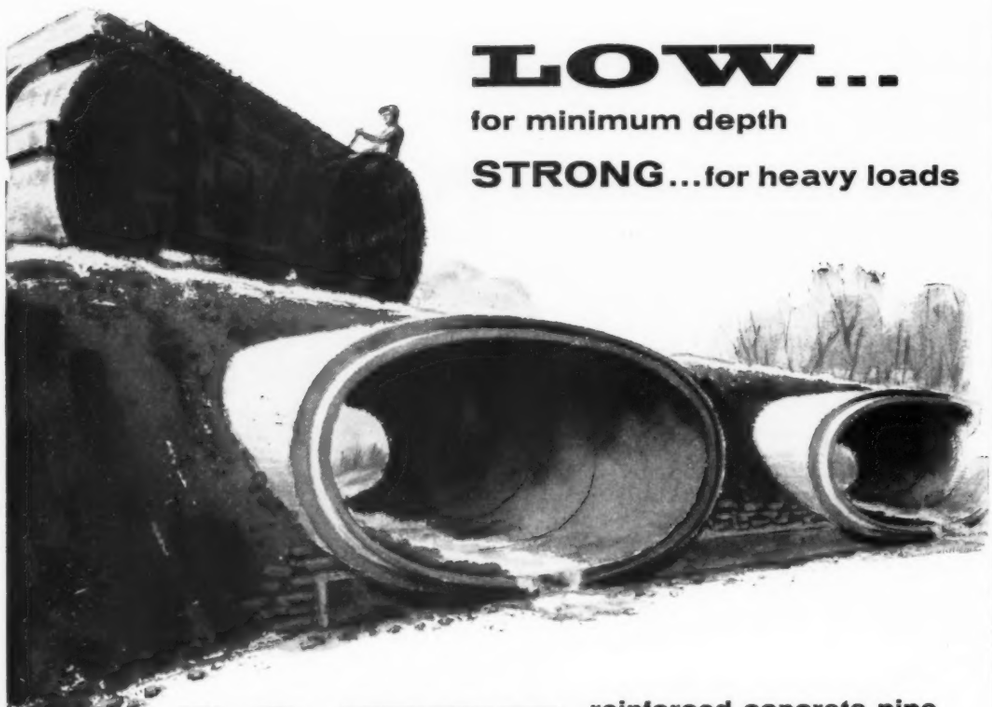
Secondly, salt stabilization will reduce the maintenance costs on these roads over a period of years, since there will be no need to add aggregate and a dust-layer every year.

This summer's project in Ohio, the largest single state pavement program using salt as a stabilizing agent, grew directly out of the need to stretch maintenance funds and to build better secondary roads for increased traffic. Until this year, maintenance of these roads required between 200 and 400 tons of gravel per mile annually. The material, and the cost of labor to add aggregate to traffic bound roads, averaged $2.50 per ton for the state.

The first step taken by the state to avoid this work and this cost was made last year when salt was adopted as a stabilizing agent, following successful experimental work done on 23 miles of road in 1955. These salt test roads were built by maintenance crews on four different routes and, according to Ohio highway officials, have stood up well during last winter. Still in good condition, they have shown no failures as the result of frost heave. The only other use of salt as a stabilizing agent in Ohio was made a few years ago, when 7 miles of salt-stabilized shoulders were built on a stretch where shoulders were narrow and it was difficult to maintain aggregate against the pavement.

### Specifications for five jobs

This year—the first year the new program became operative—five road projects in five highway districts in the south and eastern part of the state were completed. These projects ranged from continuous stretches of a single road to 1,000-foot strips of old roads which had to be rebuilt. The stretches were used by about 200 to 400 vehicles daily, most of them automobiles. All the projects were con-

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Other uses for under-highway pipe are provided by Flat-Base . . . as an underpass for pedestrians, cattle and conveyances—as utility galleries or industrial tunnels. Write today for illustrated literature.

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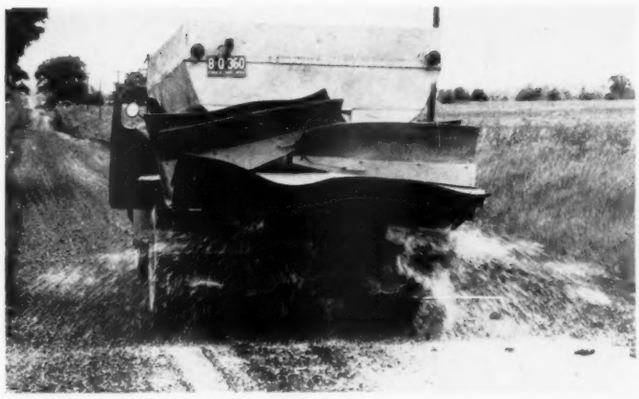


After aggregate has been spread at an average rate of 2 inches per square yard over the pulverized material, rock salt is spread on the roadway at a rate of half a pound per square yard, or 16 tons per mile for a 4-inch-thick, 18-foot pavement.

tracted out of maintenance funds at an estimated cost of $928,849. This price included the prime surface treatment and the seal on about 44 miles of road near Ashland, 71 miles in the Newark area, 98 miles near Chillicothe, 14 miles near Marietta, and 29 miles near New Philadelphia.

Under the program, and with the state furnishing the salt, the jobs were let on a uniform basis and all had the same specifications. Road profiles were to be corrected, but contracts did not call for ditch, drainage, or grade work.

### Typical procedure

Because of the varying characteristics and conditions of the roads being rebuilt, division engineers were given a great deal of freedom in supervising details of the work. Aside from selecting locations, they determined the base thickness, and the depth to which the surface was to be scarified. They were also held responsible for approving the blending and mixing, the amount of water added to the mix, and the adequacy of spreading and rolling.

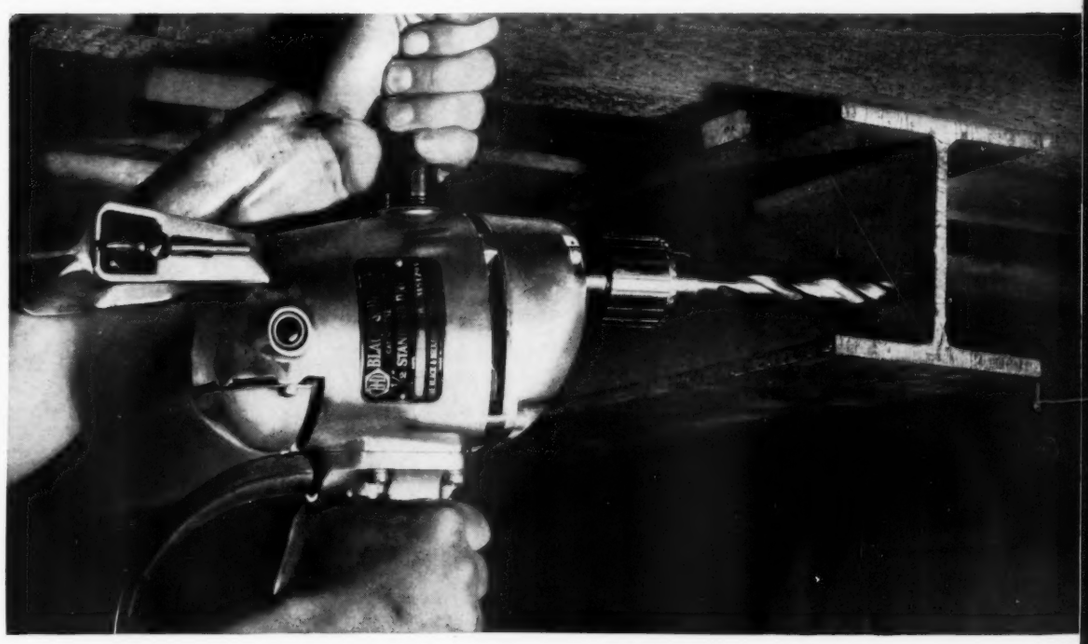
As soon as a highway had been scarified to a minimum depth of 4 inches on a typical stretch—or deep enough to eliminate all surface irregularities—a power-driven rotary pulverizer was used to break down the scarified material and make it uniform. Specifications permitted this to be done by any other approved method that would secure the same results.

This done, aggregate was spread over the surface at an average rate of 2 inches per square yard and sodium chloride (rock salt) was applied at the rate of a half pound per square yard, per inch of thickness of the conditioned material and aggregate. This came to three pounds of salt per square yard for a 6-inch base, or about 16 tons of salt per mile. The quantity of salt used fluctuated only slightly in different stretches, even though the soil varied from sandy loams to clay.

The rock salt and aggregate were then mixed with the conditioned material. This was either done in place by a mechanical mixer or a motor grader, or with any method that

(*Concluded on next page*)

For more facts, circle No. 473→

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Whatever Black & Decker Tool you buy, *this* you can be sure of: (1) It will be powered by the best electric motor in the business. (2) Its balance, compactness and lightweight mean easier handling. (3) It will be versatile, driving many accessories from among the 1,000 *plus* Black & Decker offers. (4) Its rugged construction means less down time, lower maintenance.

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See your B&D Distributor for details—or write for Catalog No. 10 to: THE BLACK & DECKER MFG. CO., Dept. 7901, Towson 4, Md. (In Canada: 80-86 Fleet St., E., Toronto 2, Ont.)

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(1) TAILORED POWER — Heart of every tool is a motor completely built by Black & Decker and tailored to the tool's specific needs.

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(3) TOP VERSATILITY — Typically, this Sander does a variety of jobs... sanding, grinding, wire brushing, buffing, wood planing.

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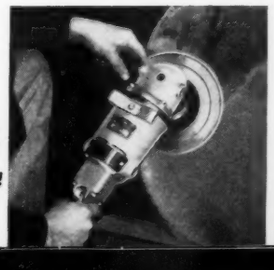

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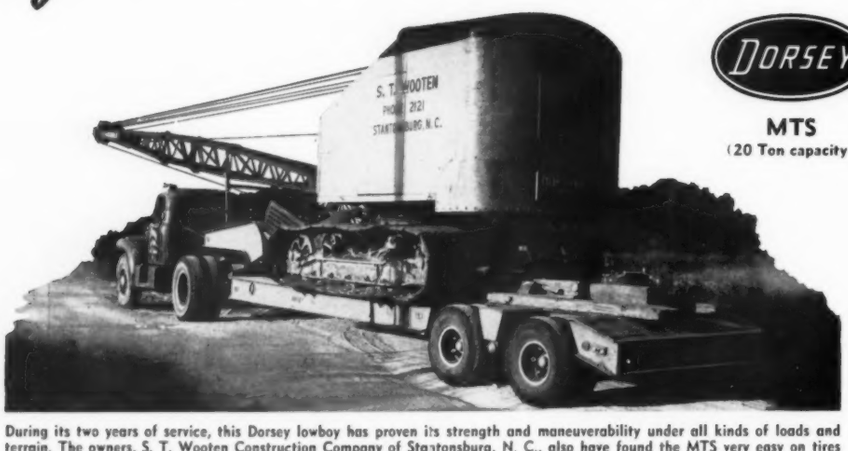
Portable electric tools . . . *power-built to last!*

Salt, new aggregate, and scarified material are mixed thoroughly by motor graders. The same amount of salt was used on all stretches, though the soil varied from sandy loam to clay. Sprinkling was done only if the mixture was too dry.

Final rolling is done by a Bros pneumatic-tire roller. The crown of ½ inch per foot was left during this operation. An asphalt prime was applied a week afterward, and another seal coat at the end of 30 days.


"Easy to handle...economical to operate"




DORSEY

MTS
(20 Ton capacity)

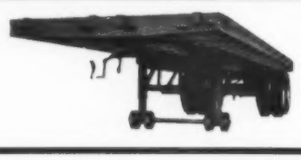
During its two years of service, this Dorsey lowboy has proven its strength and maneuverability under all kinds of loads and terrain. The owners, S. T. Wooten Construction Company of Stantonsburg, N. C., also have found the MTS very easy on tires and report maintenance expense has been limited to routine greasing. Stub axles mounted on walking beams achieve unusual load stability for the MTS. The model is available in capacities 15 to 35 tons.

For every tough job, there's a tougher Dorsey

MODEL HTS

20 Ton capacity—Weighs Only 8,250 pounds (also available in 15, 25, 30 and 35 ton capacities)

Although as much as a ton lighter than other trailers of comparable capacity, high-tensile steel main channels and close-spaced all-welded cross members give the HTS superior strength and ruggedness. Flat gooseneck provides support for blades and other loads.



THE GIANT PLATFORM

44,000 capacity — Weight: 8,410 lbs.

In the year since its introduction the Giant has become America's No. 1 platform! Although as much as 2,000 lbs. lighter than other platforms, it has even greater strength.

TANDEM TILT-TO-LOAD

15,000 and 20,000 lb. capacities — Weights: 2,500 and 2,700 lbs.

Speed and efficiency as well as economy are combined in this versatile tilt model; it's so light a dump truck pulls it easily. Two-way hydraulic control is so precisely balanced the weight of a man will tilt it up or down. Single axle models also available.

NEW SELF LOADING FLOAT

This trailer will actually carry 45,000 pounds concentrated in 10 feet of its length! The secret is the extra-deep high-tensile steel main frame that we "tailor" to length and load requirements.

DORSEY

DURING THE ROAD SHOW —
Be sure to see Dorsey's new lowboy with one-man removable gooseneck!
SEE US AT THE A.E.D. MEETING, TOO!

DORSEY TRAILERS / ELBA, ALABAMA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 474


(*Continued from preceding page*)

achieved the same results as these machines. If a patrol grader were used, the materials were handled a minimum of three times on the moldboard to assure thorough mixing.

If, in the opinion of the engineer, the mixture was too dry, it was spread out on the subgrade and sprinkled with water, then remixed until it was of uniform consistency. If the mixture was too moist, it was either spread on the roadbed and allowed to dry or alternately windrowed and spread until it was dry enough to be compacted.

If possible, the mixed material was windrowed to both sides of the road while the base was thoroughly wetted. With this done, the mixed material was then spread over the roadway in uniform layers not more than 3 inches deep, measured loose. As each layer was spread, it was shaped and compacted with either a tamping or a pneumatic-tire roller. The final rolling of each layer was done with a roller weighing at least 10 tons. A smooth surface and a crown of ½ inch per foot was left on the final layer of material.

Specifications called for the contractor to maintain or do any necessary work on a section for a period of three days following the day the work had been completed to the satisfaction of the engineer.

About a week after a project was completed, the road was primed with tar or asphalt. At the end of 30 days, the new work was sealed with another coat of bituminous material with a cover of aggregate. THE END

## Operator's guide

■ An all-color operator's guide for Caterpillar wheel tractors and scrapers is available from the company. Tips are given on checking the brakes, shifting, and scraper controls. Bigger payloads and faster hauls are stressed in the section on the earthmoving cycle—loading, hauling, dumping, and returning. Maneuvering tips and an operator's check list conclude the booklet.

To obtain Form No. 32022 write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 184.

The Buck-El Model 30 bulk-material elevating conveyor is rated at 9 tph and is available in heights up to 20 feet. A larger unit, the Type S, is available up to 50 feet and is rated at 90 tph.

## New elevating conveyor handles 9 tons per hour

■ A new bulk-material elevating conveyor that will handle up to 9 tons per hour and is available in heights up to 20 feet is announced by The Bucket Elevator Co. The Buck-El Model 30 is available with either chain or belt-mounted buckets.

The casing of the Model 30 is self-supporting and made from 16-gage carbon steel. The release of spring clamps permits removal of the casing covers from top to bottom.

For larger capacities and greater heights, the Type S unit is available. It is rated at 90 tons per hour and reaches up to 50 feet.

For further information write to The Bucket Elevator Co., 360 Springfield Ave., Summit, N. J., or use the Request Card at page 18. Circle No. 157.

## Selecting hauling trucks

■ A new booklet showing how to match the right kind of truck to any construction hauling job is available from the Ford Division of the Ford Motor Co. The 20-page booklet shows a wide selection of bodies for use in construction work. Four tables are included, matching special dump body, rock body, ready-mix dump, and transit-mix capacities to Ford truck models. An over-all table shows general construction industry applications which are met by combinations of 25 conventional Ford truck models on eight different wheelbases, with six horsepower ratings ranging from a 212-hp V-8 engine to a 133-hp 6-cylinder unit.

To obtain "How to Select the Right Trucks for Construction Work" write to the Ford Division, Truck Marketing Dept., Box 608, Dearborn, Mich., or use the Request Card at page 18. Circle No. 6.

*See the Ford Motor Co. at the Road Show in the International Amphitheatre, Booths 825 and 312.*

## Bridge rehabilitation

■ An engineering report has been prepared for those responsible for the maintenance and repair of bridges by Intrusion-Prepakt, Inc. Entitled "Bridge Rehabilitation", the 12-page technical report provides basic data and information on Intrusion-Prepakt techniques for the restoration and strengthening of bridge piers, abutments and structural members. Two technical articles on the rehabilitation of piers and abutments are included in the report, plus eight case histories.

To obtain Special Engineering Report No. 101 write to Intrusion-Prepakt, Inc., Room 568, Union Commerce Bldg., Cleveland 14, Ohio, or use the Request Card at page 18. Circle No. 10.

## Tunnel concreting

■ Studies of 12 tunnel concreting projects where Pozzolith was used are described in a catalog from The Master Builders Co. The addition of Pozzolith to the concrete mix, according to the catalog, is said to improve concrete uniformity and quality because it permits close control of entrained air and regulates the hardening rate. Each case history discusses the excavating and concreting problems encountered and solved on the projects.

To obtain the catalog write to The Master Builders Co., 7016 Euclid Ave., Cleveland 3, Ohio, or use the Request Card at page 18. Circle No. 179.

## Leschen Wire Rope names

John H. Granger and William R. Mill have been appointed sales representatives for the Leschen Wire Rope Division, St. Louis, Mo. Leschen Wire is a division of the H. K. Porter Co., Inc., of New York, N. Y.


# *Take a New Look at Tournatractor*

**Consider these many advantages on your work, now and in your future:**

**Power**...208 hp — more than any crawler tractor in its class...with less pounds-pull in the starting speeds, but more pounds-pull in the working speeds used most of the time. Operators work at higher speeds, with more yardage moved per day.

**Traction**...greater than ever! New, optional wide-base tires give still more ground contact area and better flotation in many soil conditions. Additional traction, when needed, is easily obtained by hydro-flating.

**Speed**...forward to 17.4 mph, and reverse to 7.3 mph. Instantaneous shift through constant mesh...no loss of momentum. Instant controls. Anti-friction bearings throughout power train cut power loss, give more use of speed.

**Mobility**...Tournatractor travels twice as fast as crawlers to reach on-the-job assignments and to travel job-to-job under its own power. Saves time and cost of hiring flatbed haulers and extra help to load and unload.

**Shifts instantly**...no stops, no lost momentum...gear ratios changed instantly by Tournatractor's constant-mesh transmission. Saves at least 5 seconds on every gear shift, as much as 80 minutes per 10-hour day.

**Torque converter**...a simple, trouble-free, low-pressure unit with single impeller, reactor, and turbine. Eliminates shock-loads, automatically increases engine torque to match load, provides unlimited speed-flexibility, increases operator efficiency.

**Husky, all-welded case**...provides a sturdy base. Moving parts are held in perfect alignment, last longer. All parts easily accessible through handy cover-plates. No independent oscillating assemblies to spring out of line.

**Anti-friction gear-trains**... heavy-duty, precision-cut gears mesh smoothly. Special heat-treating produces wear-resistant surface on tough cores. Constant oil-bath reduces wear. Shafts ride on anti-friction bearings, reducing power-loss and wear.

**Grouped lubrication** through fewer fittings, oil enclosures, and far fewer moving parts, combine to save operator about 5 min. work-time each shift. Sealed protection keeps abrasive dust, mud, water and other elements sealed out...lubricants sealed in. Saves lubricants, saves time, saves wear.

**4 tires vs over 500 track parts**... four tough tires eliminate multitudes of exposed wearing parts such as track rollers, bushings, pins, shoes, and seals. Reduces service, cuts costs.

**Safe to operate**...low center of gravity, all-around visibility, accessibility and quick response of controls, make Tournatractor exceptionally safe to operate. Multi-disc air brakes have *four times* the braking surface of most heavy-duty tractors.

**Interchangeable equipment**...Bulldozer, Angledozer, Root-Rake, Snow-Plow — all interchangeable — extend Tournatractor usefulness in a wide work-range. Tilt-mechanism and down-pressure attachment on dozer also available. Tournatractor pulls any type drawbar equipment.

Tournatractor can tackle tough jobs, such as breaking up rock-seams, pavement, etc. Faster push and return save time. On long cycles, on-job and between-job moves, Tournatractor speed is doubly important.

Tournatractor's sealed power-train permits travel through water, mud, dust without loss of power. Lubricants are not washed away nor filled with abrasives. Maintenance is less since 4 wheels do work of 500 track parts.

Tournatractor takes shortest route to job, via highway or cross-country. It drives through city streets without interference to traffic . . . big, low-pressure tires do no damage to blacktop, curbs, or railroad-tracks.

Tournatractor travels and works over any type of footing to clear land, push-load scrapers, dig ditches, spread fill, stockpile materials, maintain haul roads, back-fill around culverts, pull other equipment.

***See Tournatractor work on one of your own jobs***

The best way to judge today's improved Tournatractor is to see it in action on one of your own jobs. Why not give us a call? We'll be glad to arrange a demonstration on your regular work. Only in this way can you really compare your bonus profit possibilities with Tournatractor to those with your present heavy-duty tractor equipment.

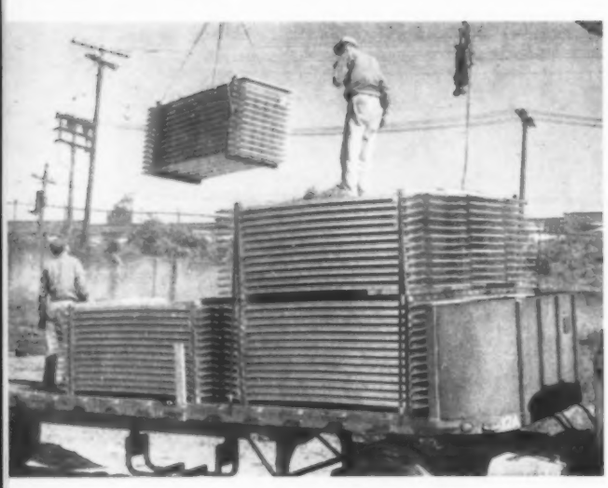
Tournatractor, Angledozer—Trademark Reg. U.S. Pat. Off. CT-1104-G-bw

**LeTourneau-WESTINGHOUSE Company**

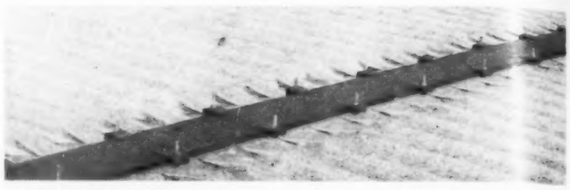
Peoria, Illinois

*A Subsidiary of Westinghouse Air Brake Company*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 475



◀ The palletized leave-in-place galvanized-steel concrete decking forms arrive at the work site on a trailer truck. The average haul for the trucks was 5,000 square feet per load. In all about 250,000 square feet of forms were used on the deck.



A series of bolted clamps secured the flanges of the adjacent stringers to cover completely the 114-foot-wide 2,721-foot-long deck. A metal seal applied to the joints between each section made the forms leak-proof.

# Expendable steel forms eliminate shoring, stripping of bridge deck

Expendable galvanized steel concrete forms, designed to be left in place, eliminated the need for shoring and stripping the deck slabs for the new 100-foot-high Central Viaduct in Cleveland, Ohio. The 114-foot-wide, 2,721-foot-long deck was built by decking subcontractor, National Engineering & Contracting Co., Cleveland. General contractor for the entire structure, which is scheduled for completion in November, 1957, is the John F. Beaseley Co., Chicago, Ill.

The largest bridge contract ever let wholly within the state, the viaduct

With no shoring or catwalks under the viaduct during pours, it was possible to paint the under side of the superstructure early.

is part of U. S. Route 42 and the Cleveland Belt System, and spans the Cuyahoga River, a valley containing four separate railroads, and several city streets.

The forms, manufactured by the United Steel Fabricators, Inc., arrived on the job in pallets that were lifted 75 feet to one end of the structure by a crane with a 100-foot boom. Consisting of trapezoidally corrugated galvanized steel sections that provide a laying width of about 29 inches, the forms were custom made to lengths matching the stringers. They span from flange to flange of the adjacent stringers and are secured to the flanges by a series of bolted clamps. No special tools were required to install the forms. A metal seal was applied to the joint between each form section to prevent leakage.

With shoring, stripping, understructure catwalks, safety nets, and special safety guards eliminated, all under-structure painting was done in advance. About 250,000 square feet of forms were required for the deck.

THE END

# THESE '57 CHEVIES TURNED THE TOUGH ALCAN HIGHWAY INTO A TURNPIKE!

They took the "teeth" out of North America's toughest truck run in an amazing display of stamina and dependability! The Chevrolet Alcan test called for great truck components . . . and here they are, the same modern features you'll get in *your* '57 Chevy!

*Modern high-compression 6's*—a time-proved Chevrolet truck 6 made the tortuous Alcan Highway test look easy . . . registered a high 18.17 miles per gallon!

*Short-stroke V8 power*—with the shortest stroke of any truck V8's, new Chevy engines stand first in their field for efficient load-pulling! Their great performance in Alaska proved it!

*Safe, sure brakes now Alcan proved*—in medium-duty models, Hydrovac power brakes* supply up to 85% of the braking effort! Powerful Air-Hydraulic brakes* gave peak stopping power in heavy-duty models!

*Unit-design cab and body construction*—Chevrolet truck cabs and bodies remained tight and solid on Alcan bumps, showed that they're built to *last!*

*Rugged Synchro-Mesh manual transmissions*—they displayed never-say-die durability . . . came through with smooth, flexible, trouble-free performance!

*Revolutionary Powermatic transmission**—Drivers of heavy-duty models reported shift-free driving ease on Yukon grades, safer downhill hauling with the hydraulic retarder!

*Sturdy frames and long-leaf springs*—these brawny chassis components proved they can take it when the going is roughest . . . took the Alcan's worst with strength to spare!

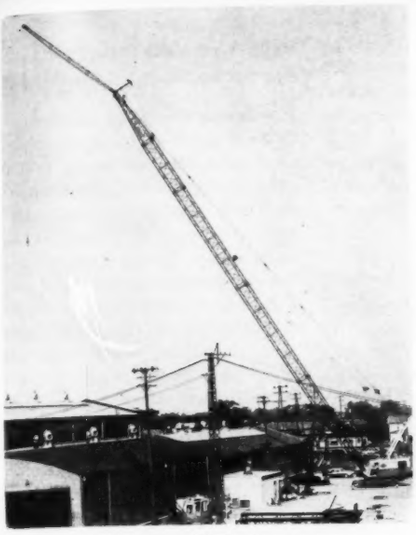
These Alcan-proved Task-Force 57 features and others like them (such as extra-heavy rear axles, mighty Triple-Torque tandem options, and new, improved tubeless tires) are ready to tame your tough truck runs too! Boost your hauling profits by seeing your Chevrolet dealer soon! . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

**Optional at extra cost.*

## 1957 CHEVROLET TASK·FORCE TRUCKS

**PROVED ON THE ALCAN HIGHWAY . . . CHAMPS OF EVERY WEIGHT CLASS!** CHEVROLET

For more facts, use Reader-Reply Card opposite page 18 and circle No. 476



The versatile Lima Type 1250 air-controlled machine can handle a 200-foot boom with a 50-foot jib for steel erection.

### Versatile machine handles 200-foot boom, 50-foot jib

■ An air-controlled crawler rig that is said to handle a 200-foot boom with a 50-foot jib when used as a crane is announced by the Baldwin-Lima-Hamilton Corp. The Lima Type 1250 when used as a crane with the super boom is recommended for steel erection and concrete pouring operations on structures as high as 24 stories.

When utilized as a standard shovel, the 1250 is equipped with a 28-foot boom, a 22-foot dipper handle, and a 3-cubic-yard bucket. As a high-lift shovel, it uses a 45-foot boom, a 32-foot dipper handle, and a 2½-cubic-yard bucket. The new rig has a lifting capacity of 100 tons at a 13-foot radius when equipped as a crane with a standard 60-foot boom.

The manufacturer points out that the 1250 can be dismantled for hauling into units weighing less than 30 tons. The counterweight segments are easily removable, and the gantry may be folded to a height of approximately 12½ feet. A choice of diesel, gasoline, or electric power, with torque converters, is available.

Features and available equipment include: independent propel, a loading-lowering device, an extra-high-speed hoist attachment, a third drum, a power reversing hoist drum, two widths of crawlers, two lengths of crawlers, two widths of crawler treads, two types of rigid gantries, and two types of folding gantries.

The 1250 has a one-piece carbon steel-cast rotating and truck base, fabricated steel machinery frames, machine-cut gears, a telescopic boom stop with an automatic shutoff, steering controlled by gear-type jaw clutches, heat-treated alloy steel ground shafting, and large-diameter clutches and brakes.

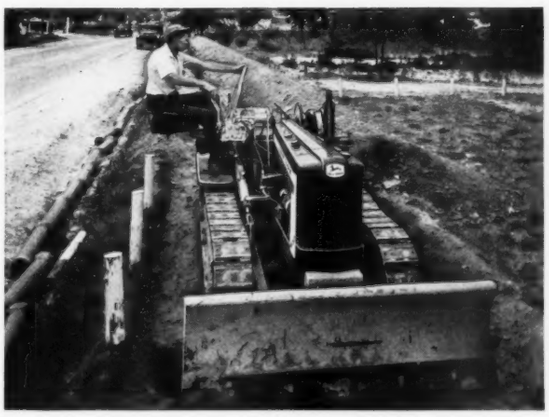
For further information write to the Construction Equipment Division of the Baldwin-Lima-Hamilton Corp., Lima, Ohio, or use the Request Card at page 18. Circle No. 189.

*A list of coming conventions appears on page 125 of this issue.*

"The boss is in training again."

# POWER Aplenty

## for MANY JOBS...at NEW LOW COSTS



**JOHN DEERE**

### *Crawler Tractor*

Compact, powerful, and low in first cost, the "420" Crawler is built to deliver years of dependable service at very low cost per hour. Rugg̃edly built. Easy to start. About 30 engine horsepower. Fewer parts to wear, easily serviced, very low fuel consumption. Your choice of 4- or 5-roller frame . . . track shoes to fit your needs. Optional equipment includes smooth, fast-working single or double hydraulic system, direction reverser, new 3-point hitch for rear-mounted equipment, and 5-speed transmission. Wide choice of matched working equipment for nearly all jobs, including John Deere Loader, at left.

**JOHN DEERE**

### *Utility Tractor*

This wheel-type, stay-on-the-job power unit can boost your profit margin on many kinds of work. Low in first cost, low in upkeep, remarkably low in fuel costs. Cuts "down time" to a minimum because of simple, rugged construction. Highly maneuverable. Has unusual stability when carrying loader, backhoe, or similar equipment. Built low—easy to get on and off, sure-footed on slopes. Optional equipment includes direction reverser, 5-speed transmission, and power-adjusted rear wheels. Shown with loader and backhoe. 3-point hitch regular.

**DIRECTION REVERSER**

***. . . a Real Time-Saver***

Optional for Crawler and Utility tractors. Lets you move forward or backward in same speed without shifting gears. Investigate—you can save as much as an hour a day in travel time on loading, dozing, and many other jobs!

***. . . Now Ready for You!***

**Some of the Equipment Available**

| | | | |
|---|---|---|---|
| Loaders | Scrapers | Sweeper | Seeders |
| Scarifiers | Trenchers | Crane | Scoop |
| Backhoes | Generator | Snow Plows | Fork Lift |
| Dozers | Pump | Sprayers | Power Saw |
| Cutter-Bar Mower | | Cement Mixer | Gang Mower |

**John Deere, Industrial Division**
**Moline, Illinois**

JOHN DEERE Industrial Tractors and Equipment

Backed by nearly 40 years of tractor manufacture for dependable service and quality.

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

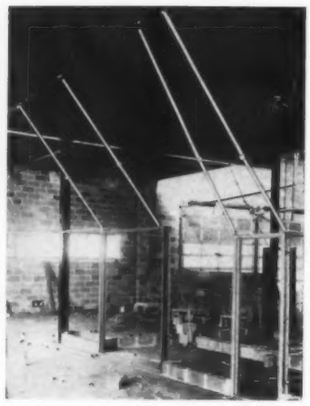
AMERICAN ROAD BUILDERS ASSOCIATION

For more facts, use Reader-Reply Card opposite page 18 and circle No. 477

## Adjustable door buck rod simplifies frame setting

■ An adjustable door buck that is said to permit window and door frames to be set in concrete twice as fast as when wooden door bucks are used is available from Sinclair Industries, Inc. The re-usable Buck-Up is made of tubular steel and is cadmium-plated to prevent rust.

Instead of measuring, cutting, fitting, bracing, and nailing wooden door bucks, the contractor clamps the Buck-Up to the door or window frame; adjusts it to reach, and be secured to, an expose beam or other anchor; and locks it in position. When the frame has set, the clamps and spade bolt are loosened, and the Buck-Up is ready to be used again.



Sinclair Buck-Ups are reusable and are said to halve the time required to set window or door frames with wooden bucks.

To cover most needs, the Buck-Up is available in two models. Model 400 is adjustable up to a 12-foot ceiling height, and Model 480 is adjustable up to 15 feet.

For further information write to the Sinclair Industries, Inc., 1317 Kentucky Ave., St. Louis 10, Mo., or use the Request Card at page 18. Circle No. 154.

## Anthony buys Truck Crane

The Anthony Co., Streator, Ill., recently completed negotiations for the purchase of Truck Crane, Inc., of Chicago, Ill. All manufacturing, sales, and service functions will be transferred to the main plant at Streator. Sales distribution will be through Anthony's national distributor setup.

## Water-cooled manifolds for turbocharged engines

■ Water-cooled exhaust manifolds on its D375 and D397 turbocharged engines have been announced by the Caterpillar Tractor Co. In certain installations, these water-cooled manifolds offer two prime advantages, the manufacturer reports. They help reduce engine-room temperatures, providing more comfortable conditions for personnel, and they offer a safer installation under critical conditions by reducing the fire hazard.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 194.

*Visit the Caterpillar Tractor Co. at the Road Show in the International Amphitheatre, Booths 701 and 720.*

## Low-pressure burners

■ A bulletin describing the Standard Model S-H low-pressure atomizing burner is available from the Standard Steel Corp. Designed for operation with the exhaust systems on Standard asphalt plant dryers, the new burners are said to produce a penetration and equalization of heat in the dryers heretofore not possible in a low-pressure burner. The S-H units, furnished completely assembled on a common base, include two air-atomizing jet-type (28-ounce) burners and an air-atomizing igniter burner. The units are available with gas, oil, or combination gas and oil burners.

To obtain this bulletin write to the Standard Steel Corp., 5007 S. Boyle Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 15.

*Visit the Standard Steel Corp. at the Road Show in the International Amphitheatre, Booth 235.*

## Steel-frame centers

■ Shopping centers framed with structural steel are pictured in a brochure from American Institute of Steel Construction, Inc. Various kinds of shopping centers are pictured and pertinent details about each structure are discussed. Blueprints accompany the data. A chart presents detailed information on the layout and construction of regional, district, and neighborhood centers.

To obtain Brochure No. 17A write to American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 183.

## Bucyrus-Erie to build drill plant in Indiana

A $12 million drill manufacturing plant will be built near Richmond, Ind., by the Bucyrus-Erie Co., South Milwaukee, Wis. Located on a 148-acre site on U. S. 40, the new plant will provide 300,000 square feet of floor space for manufacturing.

The plant, which will employ about 1,000 people, is scheduled for completion late this year or early in 1958.


Here's why

ATECO ROCK RIPPERS

lick jobs others can't touch!

TOUGHEST, BEST-DESIGNED SHANKS!
Contoured for extra strength at strain points; made of manganese-moly steel, heat treated four times. Special forged alloy straight shanks for sandstone also available.

DRAWBAR MOUNTING SAVES YOUR TRACTOR!
Rugged ATECO drawbar takes the pull, protects you against costly transmission case damage.

HEAVIEST-DUTY CONSTRUCTION ON THE MARKET!
Tool beam, for example, is box-girder welded of 1½" steel plate with sides in compression. Solid steel—not the weld—takes the strain.

OUTPERFORMS 'EM ALL! Replaceable rock points have splitting wedges; underground "quiver" of curved shanks works like a jackhammer to shatter rock and shale fast, with less power. Rock is rolled up and out in the clear, back of tool beam.

Make your tractor a 3-way profit maker with an ATECO ripper plus your dozer—ready to rip, bulldoze or push-load instantly without tool changing! No other ripper on the market matches ATECO's reliability and performance—why settle for less? Promptly available for all popular heavy duty crawler tractors—see your dealer or write for literature. Please address Dep't C-1.

American

39

ATECO TRACTOR EQUIPMENT

Corporation

Designers and Manufacturers Since 1920

9131 SAN LEANDRO BOULEVARD • OAKLAND 3, CALIFORNIA

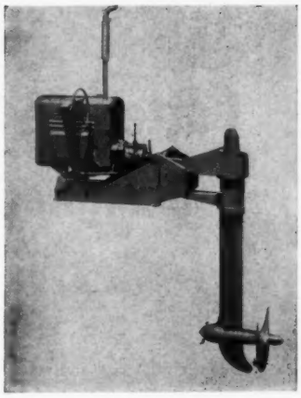
For more facts, use Reader-Reply Card opposite page 18 and circle No. 478

## Outboard power unit gives propeller-thrust steering

■ The new Utility Series Harbormaster outboard propulsion and steering units announced by Murray & Tregurtha, Inc., are recommended for powering barges, towboats, and workboats in bridge construction, dredging, and other construction operations handled from marine craft.

The units are available in 40 and 60-hp gasoline or diesel models. They offer propeller-thrust steering from 30 degrees port to 30 degrees starboard. The outboard drive section elevates above the deckline for maintenance and repairs.

For further information write to Murray & Tregurtha, Inc., 80 Hancock St., Quincy 71, Mass., or use the Request Card at page 18. Circle No. 66.



The Utility Series Harbormaster.

## Ephemeris for 1957

■ The 1957 edition of the Gurley Ephemeris, available to surveyors and engineers, again includes charts for the simplified computation of Polaris. Introduced in the ephemeris of last year, the charts are used in determining Polaris by a new method which takes only a fraction of the time formerly required. The publication also includes an almanac, an abridgment of the American Nautical Almanac, listing 28 selected stars for determining stellar observations. The stars were selected by the cadastral engineers of the Bureau of Land Management, Department of the Interior. The almanac gives complete instructions for determining azimuths by methods similar to those used in observations of the sun and Polaris. Charts for sun and Polaris, as well as definitions of astronomical terms and many sample problems, are also found in the ephemeris.

To obtain this booklet write to W. & L. E. Gurley, 518 Fulton St., Troy, N. Y., or use the Request Card at page 18. Circle No. 7.

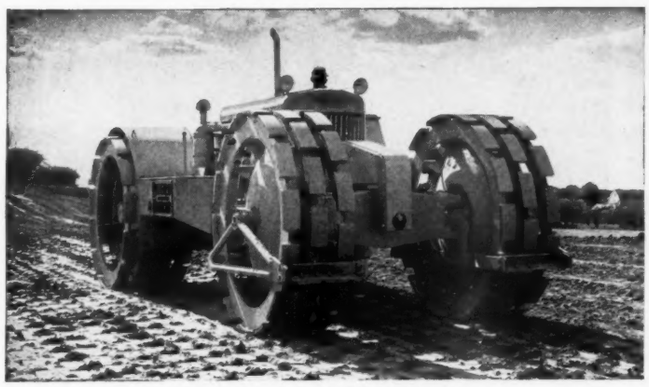
## Heavy-duty tractor

■ The International 300 Utility tractor is detailed in a catalog from its manufacturer. The hydraulic unit has a maximum belt horsepower of 42.84 and a drawbar horsepower of 39.48. Attachments for the unit include backhoe, angledozer, scraper, trencher, center-mounted blade, fork lift, platform carrier, and rotary tillers. Complete specifications are given.

To obtain Catalog CR-239-F write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 181.

## H. K. Porter to build

H. K. Porter Company, Inc., New York, N. Y., has announced plans to construct a seventeen-story office building at Sixth Avenue and Grant Street, Pittsburgh, Pa. The company plans to have general offices occupying six floors of the new building; the remainder will be rented to tenants. It is proposed that by mid-1958 the building will be ready for occupancy.

THE BUFFALO-SPRINGFIELD K-45 KOMPACTOR

# How to select compaction equipment

The logical question to ask yourself when you are ready to buy new compaction equipment is: "Exactly what do I need the equipment for and how will I use it?"

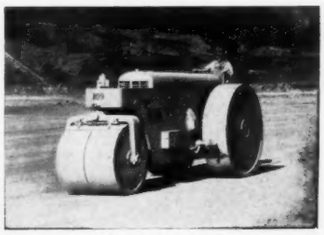
**BASE FILL COMPACTION**—This type of compaction demands equipment that will handle a wide variety of materials, give you the highest degree of compaction with the fewest passes. Buffalo-Springfield's revolutionary K-45 Kompactor is proving a real money-making answer for this type of work. It is self-propelled, relies on the "Interrupted Pressure Principle." All compaction effort is directed downward. Contractors testify they are meeting density requirements in one-fourth the time normally required with other compaction equipment.

**FINE GRADE FINISHING**—Buffalo-Springfield offers six 3-wheel rollers, ranging in capacity from 5 to 15 tons, to handle the large variety of materials found in fills, subgrades and unfinished bituminous pavements. The variable-weight 3-wheel roller is ruggedly built for years and years of hard, maintenance-free work.

Buffalo-Springfield's thoroughly-proved 3-axle tandem "walking beam" roller provides up to 60% greater tonnage compacted per day in superhighway construction, airport and military establishment jobs where specifications are extra strict.

**ASPHALT FINISHING**—Two-axle Tandem Rollers are designed especially for all surface finishing jobs. Ranging from 5 to 16 tons, Buffalo-Springfield Tandems are used for heavy-duty highway and public works projects, and all types of finishing, maintenance and repair work. A wide selection of models for the biggest to the smallest jobs are designed for long-life and profitable operation.

THE BUFFALO-SPRINGFIELD KX-3 AXLE TANDEM



3-WHEEL ROLLERS

TWO AXLE TANDEMS

**SHORT ROLLING JOBS**—Buffalo-Springfield's 3-5 ton portable roller is widely used for rolling driveways, sidewalks, parking and playground areas, and for patching and light finishing jobs. It is highly maneuverable and portable from job-to-job. Write today for full information on the type of equipment you need—or see your nearest distributor for an on-the-job demonstration.

3-5 TON PORTABLE TANDEM

THE STANDARD OF COMPARISON — KOEHRING — KOEHRING

**BUFFALO-SPRINGFIELD**
**Roller Division-Koehring Company**
SPRINGFIELD, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 480

# Cutterhead and dustpan dredge designed for tough river job

***Hydraulic, self-propelled dredge is diesel powered; special equipment includes three spuds for anchoring***

A combination dustpan and cutterhead dredge—the first of its kind ever built—is currently under test in the Magdalena River in the Republic of Colombia in preparation for the start of full-scale river improvement and maintenance operations that will start in February.

The M. O. P. DH-6 Adenavi, specially built by Ellicott Machine Corp., Baltimore, Md., for its job of improving the Magdalena, has a number of unique design features that equip it well for its work. Both the dustpan and cutterhead attachments make it possible for the dredge to pick up material ranging from free-flowing silt to compact clay and coarse gravel. As a dustpan, it has a rated output of 2,000 cubic yards of material per hour. As a cutterhead, it handles about 850 yards of material hourly.

Hydraulically operated and self-propelled, the dredge has a total of 2,000 horsepower and is equipped with dual motors that enable it to reach a speed of about eight knots when it is moving from one operation to another. The hull, built by American Bridge Co., Trenton, N. J., measures 200×44×7½ feet. The dredge has three spuds—two at the stern for use when the Adenavi is working as a cutterhead, and one at the bow for use during dustpan operations. A newly designed swivel discharge pipe has been designed to permit the dredge to work in the island-cluttered, irregular Magdalena.

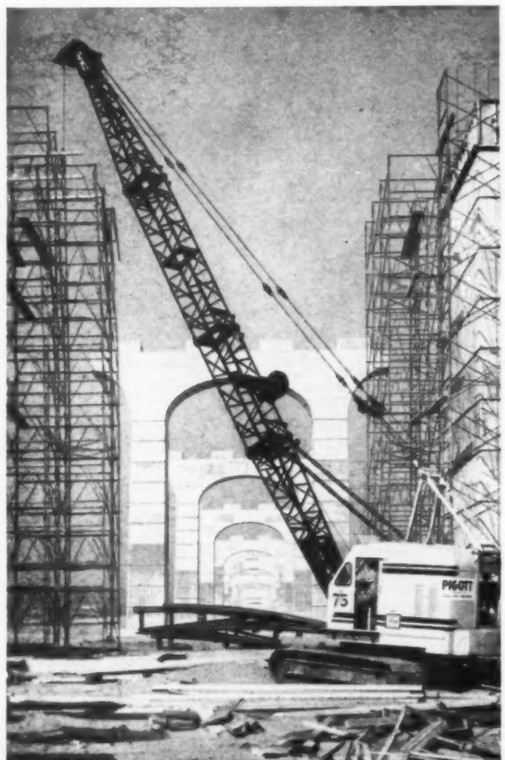
#### Important job

The Adenavi will work mainly as a dustpan dredge in maintaining a 600-mile stretch of the Magdalena—from the Caribbean port of Barranquilla to the river port of La Dorada. This stretch of the river—the Mississippi of Colombia—is of vital importance to Colombia's economy. With no extensive highway system, and no railroad linking the coast and the interior, Colombia relies on shipping in the Magdalena to carry its exports, many of which go to the U. S., and its imports, 90 per cent of which come from the U. S.

Keeping the river open will be no easy task. During the dry season, the water level drops so low that ships with an appreciable draft cannot get to upstream ports. In the navigable 600-mile stretch, the Adenavi will deepen channels, so that the water level will be high enough for year-round navigation. The cutterhead attachment will be used to cut through small islands, sand bars, and other land obstructions so that the river's course can be straightened. In the future, whenever it is not working as a dustpan dredge to keep the river channel free of silt and debris, the Adenavi will operate as a cutterhead to build up land areas near the river for dock and port installations.

#### Dustpan and cutterhead

When working as a dustpan dredge in the river channel, the Adenavi will be able to dig to a depth of 26 feet, making a longitudinal trench about 30 feet wide and 2,000 feet long before its forward spud has to be relocated. The jetting nozzles of the dustpan attachment will be supplied with water by two large centrifugal pumps, one driven by an electric motor, the other by a diesel engine. Both

**GAR WOOD 75B EXCAVATORS** give you the capacity you need, the easy convertibility you want to handle a wide range of jobs. Available on crawlers or as highly mobile 20-ton truck crane. Both units are fully convertible with a complete line of ¾ yard attachments.

When you buy equipment for

STANDARDIZE ON

**GAR WOOD - ST. PAUL DUMP BODIES,** matched with Strong-Arm hydraulic hoists, deliver the payloads you need at a lower net cost per payload hour. The line includes standard-duty, heavy-duty, extra-heavy-duty and telescopic models.

**GAR WOOD TRACTOR EQUIPMENT** reflects many years of construction machinery engineering experience. Gar Wood's line for Euclid includes a Tipdozer, Dozecaster, revolutionary new ripper and both hydraulic and cable control units.

**GAR WOOD-BUCKEYE SPREADERS** give you the speed you want, the accuracy you need to distribute materials at lowest cost. Hitching is fast, safe and automatic. Flow is accurately regulated for uniform or tapered spread.

GAR WOOD INDUSTRIES, IN

PLANTS IN WAYNE AND YPSILANTI, MICH

The first dredge of its kind, the Adenavi has a maximum rated output of 2,000 cubic yards per hour when used as a dustpan dredge. As a cutterhead, it has a maximum output of 850 cubic yards per hour.

these pumps are interconnected so that they can be used independently, either parallel or in series, depending on the type of material being picked up.

As the jetting pumps deliver the river water to the jetting nozzles to stir up the river-bottom material, the dustpan attachment will suck up the loose material, together with the water in which it is suspended, and pass it through the dredging pump system, discharging into the river, so that the loose material can be carried downstream.

The cutterhead attachment, which has a 33-foot digging depth, a 24-inch suction, and a 20-inch discharge, can be substituted for the dustpan attachment in about half a day because of the special design of the dredging ladder. Whenever the dredge is digging clay or compacted gravel, or gouging channels through land areas, the Adenavi will be held by two stern spuds, fabricated of steel shapes and plates and provided with special cast-steel points that penetrate the river bottom. These aft spuds are 28 inches square in section.

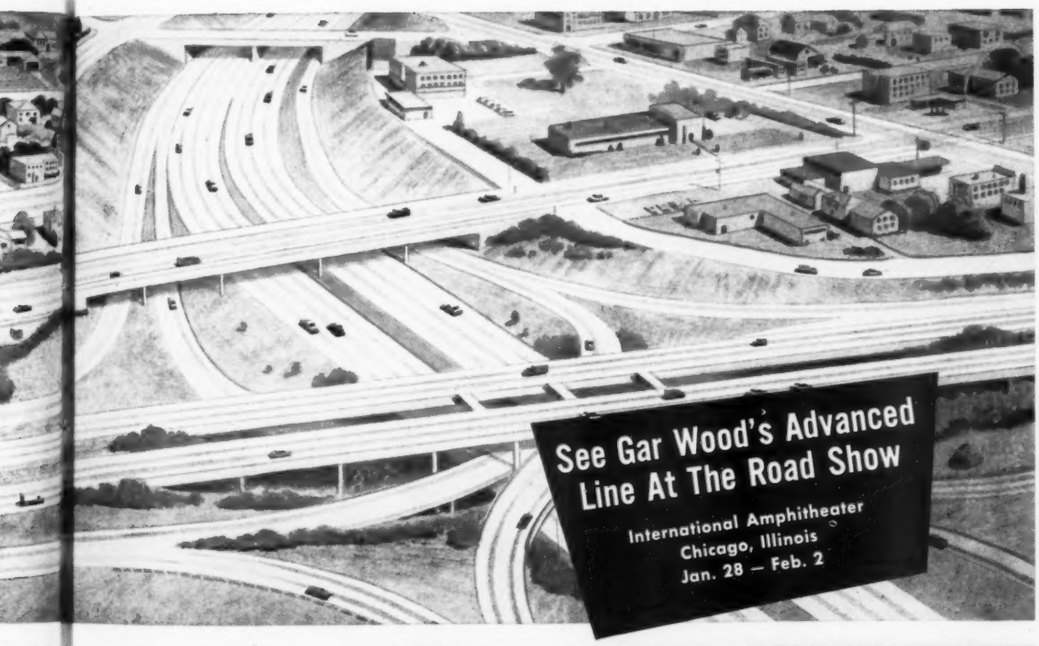
The third spud on the dredge—located near the bow of the hull and used during dustpan operations—is similarly fabricated but is 24 inches square in section. Specially designed winches with variable speed controls are used to pull the dredge ahead on lines that are anchored 2,000 to 3,000 feet in front of the rig.

Unique in this dredge is a General Motors 1,200-hp diesel engine that drives the 20-inch dredging pump and also operates the two generators producing energy for the propulsion motors. This engine, a 300-hp diesel that drives the pump supplying jetting water, and a 500-hp diesel-electric generating system for auxiliaries, bring total horsepower on the dredge to 2,000.

Equipped with comfortable living quarters, including a modern galley with refrigerating equipment, the Adenavi will soon be in round-the-clock operation on the Magdalena, joining four smaller Ellicott dredges that have been working to improve Colombia's waterways and reclaim land. The National Association of Boat Owners, which purchased the dredge backed by a financial guarantee from the Colombian government, also has long range plans for the Adenavi. Plans for the dredge—when it can be spared—call for the Adenavi to work in a 200-mile section of the Magdalena starting at La Dorada, the farthest point upstream that can now be reached by shipping. THE END


for the road ahead,

ON GAR WOOD AND SAVE!



GAR WOOD-BUCKEYE FINEGRADERS can contribute to bigger paving profits. They are easily operated by one man . . . can produce up to 420 feet of 24-foot grade per hour exactly to specifications.

GAR WOOD-BUCKEYE'S HI-WAY WIDENER digs up to a mile of clean, graded trench per day. It is the only low-cost, one-pass method of excavating and subgrading along the shoulder on highway-widening jobs.

GAR WOOD-BUCKEYE DITCHERS have been digging "more ditch per dollar" for more than 60 years. You'll find today's most advanced ladder- and wheel-type models in the complete Buckeye line.

INC. Wayne, Michigan

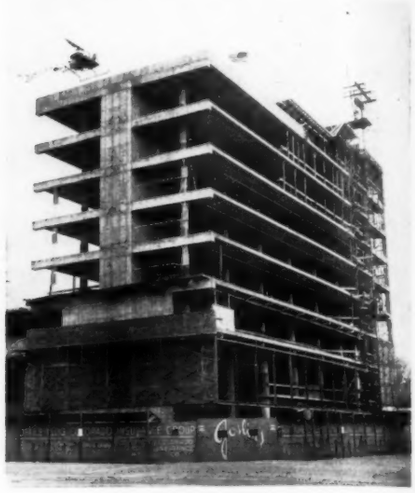
FINDLAY, OHIO; MATTOON, Ill.; RICHMOND, CALIF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 481

# Swift forming technique helps small crew on new office building

***Paper forms used for 25-foot-high, 32-inch diameter columns; reinforced-concrete floor slabs of structure are cantilevered***

Some of the Sonotubes for the 32-inch-diameter columns that rise to a 3-story height from the ground floor are still in place as concrete work continues on the upper floors. Concrete delivery to upper stories is made by the Archer tower, right.



An office building that houses a radio station and has a helicopter landing area on its penthouse roof almost demands up-to-date construction techniques. And that is just what the contractor, Jack H. Cys Construction Co., Denver, Colo., used on the recently completed Colorado Insurance Group Building in Boulder, Colo.

This reinforced-concrete structure, located on a 200×140-foot corner lot at 1919 14th St., was recently completed at a cost of $1,566,000. Of cantilever slab construction, its floors are supported on 32-inch-diameter columns. It has a 9-story section, measuring 51×140 feet and an adjoining 3-story section, 60×116 feet, on its west side. The remainder of the site is occupied by an 89×140-foot asphalt-surfaced parking lot. Curtain walls of glass and aluminum with porcelain-faced insulation panels enclose the east and west sides of the building. Red brick, backed by cinder block form the north and south exterior walls.

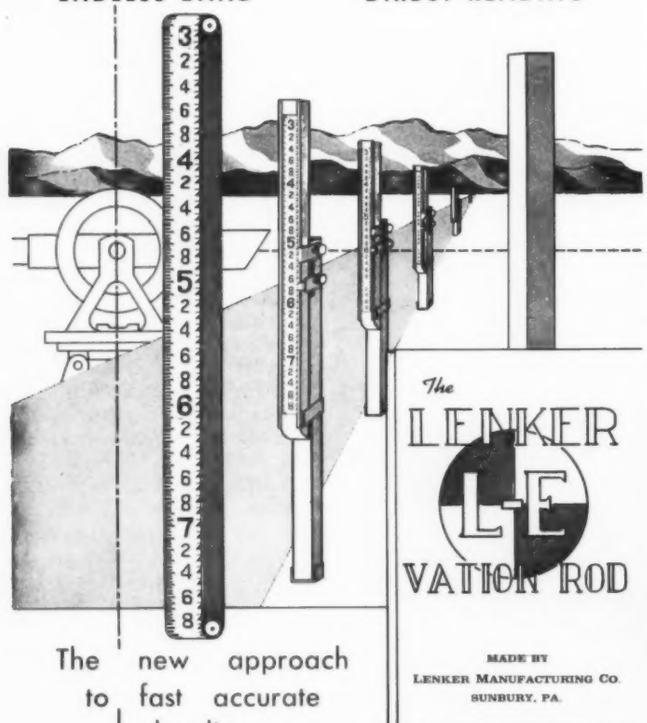
### Keep excavation dry

Excavation for the structure's basement and subbasement, done under a subcontract by National Construction Co., Boulder, was handled by two Bucyrus-Erie TD-9 loaders and five Ford F-7 dump trucks. A dragline with a 1¼-yard bucket, assisting in this operation, was also used to support the Vulcan No. 5 pile hammer that drove interlocking sheet piling along the 22-foot-deep sides of the excavation adjoining the subbasement. This piling was driven to refusal by a pile driver that was powered by a Gardner-Denver compressor driven by a Cummins 400-hp diesel.

Since the water table was about 8 feet below natural ground, an open


LENKER

ENDLESS BAND DIRECT READING



The new approach to fast accurate leveling

The LENKER L-E VATION ROD

MADE BY LENKER MANUFACTURING CO. SUNBURY, PA.

● THE ROD

The Lenker L-E Vation rod is a weatherproof maple two-section surveying rod designed for modern engineering needs.

The rod is 5.4 feet long when closed and 10 feet when extended. By using our 4 foot boot this can be increased to 14 feet.

● THE BAND

Numerals are printed on a white durable 10 foot endless steel band graduated in feet either to tenths and hundredths or to inches and eighth inches.

The Lenker L-E Vation rod has been awarded the EDWARD LONGSTRETH MEDAL OF MERIT by the Franklin Institute

For more facts, use Reader-Reply Card opposite page 18 and circle No. 482

LOW COST POWER for WRECKING-SMASHING

FREDERICK CAST Semi-Steel DROP BALLS

Tough, rugged Frederick Drop Balls eliminate expensive drilling, blasting . . . deliver smashing low cost power when you want it, where you want it. Exclusive "Pear-shape" design drops straight—swings true—withstands greater impact. Balls 4000 lbs. or over are made of extra durable nickel alloy—or special alloys furnished on request. "E-Z" Swing recessed steel eye gives greater cable protection plus free swinging action. Balls can be furnished with replaceable pins. Use Frederick Cable Weights (135 & 250 lbs.) and Frederick Swivels on all size balls for true, safe cable performance. Special release hooks for free dropping also available.

**Wide range of sizes and weights:**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Pear shape (lbs.)..... | 1500 | 2000 | 3300 | 4000 | 5200 | 6500 | 8000 |
| Ball shape (lbs.)..... | 500 | 1000 | 2000 | 5200 | | | |
| Spherical shape (lbs.). (for magnet use) | 470 | 950 | 1650 | 2400 | 3000 | 3700 | 5400 |

Write us today for prices and illustrated literature; order Balls direct or see your nearest Equipment Dealer.

FREDERICK IRON & STEEL, INC.

FREDERICK Established 1890 MARYLAND

Phone: MOnument 3-5111

*Makers of Manhole Frames, Covers and Steps • Storm Gratings Meter Frames and Covers • Centrifugal Pumps • Grey Iron Castings*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 483

*Take a good, long look and see everything that's new and different in the 1957 Lorains. Modern cab designs, new models, different type crane booms, increased capacities, easier power controls, "Shear-Ball" mountings and torque converters . . . these are some of the more important features. There are many, many more—for more economical operation, increased output, greater operator comfort and ease of operation and greater efficiency in every way! These pages will give you an idea of what Lorain has to offer in 1957. TAKE A GOOD LOOK AT THE NEW LOOK IN THEW LORAIN.*

## *take a look at the new 2½-yd.* LORAIN-85A

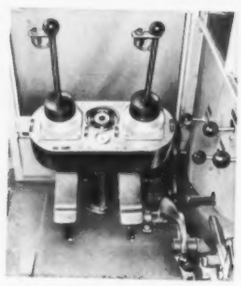
The new 2½-yd. Lorain-85A is the most different looking of the new Lorains because it wears the new cab design that is new in appearance, new in operator comfort, convenience and protection—and the rest of the "85A" matches the advanced cab design. Take a look at these features: 2-lever, "Joy-Stick", metered-air controls for all friction clutches—air control of all crawler operations—"Shear-Ball" mounting that eliminates center pin and rollers of all kinds—choice of 2 crawlers—torque converter power-take-off—new square-tubular-chord boom permitting lengths of 200 ft. plus tip—40, 50, 60-ton cranes.

# *Take a GOOD LOOK at these 3 exclusive LORAIN FEATURES*

### "SHEAR-BALL" MOUNTING*

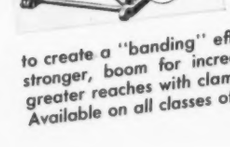
This exclusive patent-applied-for feature is standard or available on most Lorains. It truly gives "ball bearing," rock-steady swing and completely eliminates center pin and nut, centering gudgeon, hook or top rollers and exposed roller path with their attendant wear, need of adjustment and maintenance. There is nothing else like it.

### 2-LEVER "JOY STICK" POWER CONTROLS



*This type of "Joy Stick" controls power-actuates all turntable friction clutches for easier, faster, simpler operation. Uses only 2 levers instead of the usual 3 or 4. Reduces operator motion, effort and fatigue. Increases production. Now available on all classes of Lorains. No other type of controls is so effortless to use.*

### SQUARE-TUBULAR-CHORD BOOM*



This new Lorain patent-applied-for boom design has startling advantages over conventional types. The main chords are of square tubing—the lacings of continuous round tubing welded at common points to the chords to create a "banding" effect. The result is a lighter, stronger, boom for increased lifting capacities and greater reaches with clamshell and dragline buckets. Available on all classes of Lorains.

*U.S. and foreign patents applied for.

## CRAWLERS

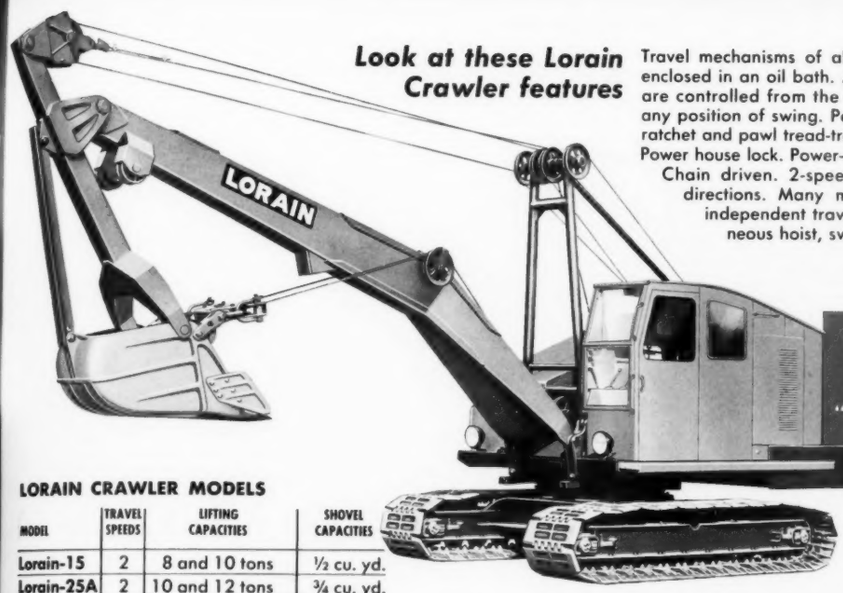
Crawler-mounted Lorains are built to conquer the worst possible terrain and travel conditions. Many models offer a choice of crawler lengths and widths, as well as tread widths to match job needs. Maneuverability, ruggedness, good soft-ground flotation and resistance to "nosing-in" are additional features of Lorain crawlers.

## MOTO-CRANES

Lorain Moto-Cranes provide unlimited rubber-tire, high speed mobility (up to 45 mph) to move between and around the jobs fast. "Moto-Crane" carriers are Lorain-designed-and-built to do a job no commercial motor truck chassis can do under the stresses and strains of shovel-crane operation. Today's Moto-Crane is the result of 39 years of experience in building rubber-tire cranes . . . more than any other manufacturer.

## *Look at these Lorain Crawler features*

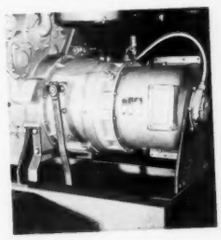
Travel mechanisms of all Lorain crawlers are enclosed in an oil bath. All crawler operations are controlled from the cab with turntable in any position of swing. Power-operated, 4-way ratchet and pawl tread-travel lock. Power steer. Power house lock. Power-operated jaw clutches. Chain driven. 2-speeds available in both directions. Many models available with independent travel, permitting simultaneous hoist, swing and travel.




*See the New LORAIN-26 with "Joy Stick" Controls Booth No. 503*

**LORAIN CRAWLER MODELS**

| MODEL | TRAVEL SPEEDS | LIFTING CAPACITIES | SHOVEL CAPACITIES |
|---|---|---|---|
| Lorain-15 | 2 | 8 and 10 tons | ½ cu. yd. |
| Lorain-25A | 2 | 10 and 12 tons | ¾ cu. yd. |
| Lorain-26 | 2 | 15 and 17½ tons | ¾ cu. yd. |
| Lorain-50 | 1 | 20 tons | 1 cu. yd. |
| Lorain-56 | 1 | 25 and 30 tons | 1¼ cu. yd. |
| Lorain-72 | 2 | 30 tons | 1½ cu. yd. |
| Lorain-85A | 2 | 40 to 60 tons | 2½ cu. yd. |

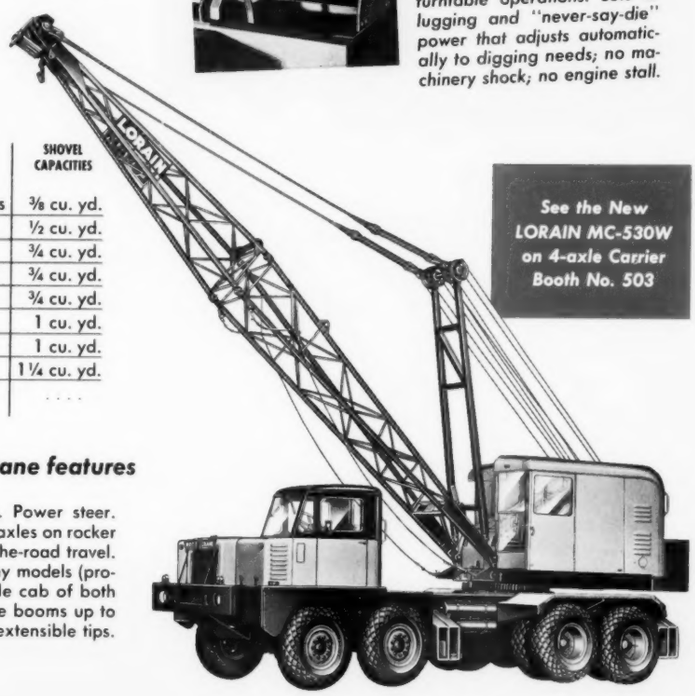


**TORQUE CONVERTER**

*Torque converter power-take-offs are available on all classes of Lorains. This is the most efficient, smoothest method of taking full advantage of the abundant power supplied for turntable operations. Lots of lugging and "never-say-die" power that adjusts automatically to digging needs; no machinery shock; no engine stall.*

**LORAIN MOTO-CRANE MODELS**

| MODEL | CARRIERS | LIFTING CAPACITIES | SHOVEL CAPACITIES |
|---|---|---|---|
| MC-107 | 6x4 | 7 & 8 tons | ⅜ cu. yd. |
| MC-110 | 6x4 | 10 tons | ½ cu. yd. |
| MC-254 | 6x4, 6x6 | 15 tons | ¾ cu. yd. |
| MC-254W | 6x4, 6x6 | 17½ tons | ¾ cu. yd. |
| MC-424&W | 6x4, 8x4 | 22½ tons | ¾ cu. yd. |
| MC-425&W | 6x4, 8x4 | 25 tons | 1 cu. yd. |
| MC-530 | 6x4, 6x6, 8x4 | 30 tons | 1 cu. yd. |
| MC-530W | 6x4, 6x6, 8x4 | 35 tons | 1¼ cu. yd. |
| MC-875 | 6x4 | 75 tons | . . . . |




*See the New LORAIN MC-530W on 4-axle Carrier Booth No. 503*

## *Look at these Lorain Moto-Crane features*

6x4, 6x6, and 8x4 carriers available. Power steer. Power brakes. Big multiple tires . . . rear axles on rocker beams and ample tractive effort for off-the-road travel. "Dual-remote" control available on many models (provides one-man operation from turntable cab of both turntable and carrier operations). Crane booms up to 200 ft. Pin-connected booms. 2-piece, extensible tips.

LOOK WHAT'S NEW IN

# SELF-PROPELLED CRANES

## THE NEW LORAIN SP-107

**LORAIN SELF-PROPELLED MODELS**

| MODEL | CARRIERS | LIFTING CAPACITIES | SHOVEL CAPACITIES |
|---|---|---|---|
| SP-107 | 4x2, 4x4 | 7 tons | 3/8 cu. yd. |
| SP-110 | 4x2, 4x4 | 10 tons | 1/2 cu. yd. |
| SP-254 | 6x4 | 15 tons | 3/4 cu. yd. |
| SP-254W | 6x4 | 17½ tons | 3/4 cu. yd. |
| SP-424 | 6x4 | 22½ tons | . . . |
| SP-530 | 6x4 | 30 tons | . . . |
| TSP-530W | 8x4 | 35 tons | . . . |
| TSP-875 | 6x4 | 75 tons | . . . |

The 7-ton Lorain SP-107 is an entirely new concept of the Self-Propelled shovel-crane idea. The SP-107 is designed to eliminate many of the mobility, maneuverability and job application limitations of the ordinary Self-Propelled machine. Here is the first Self-Propelled machine that can be classed properly as a contractor's tool—it is equally at home and profitable with shovel, hoe and dragline booms as it is with crane and clamshell attachments.

**LOOK AT SOME OF THESE FEATURES:**

7-ton lifting capacity • Completely convertible to crane, shovel, dragline, clamshell or hoe • 2 or 4-wheel drive • 2 or 4-wheel steer (4-wheel steer enables machines to "crab" sideways for a new degree of maneuverability) • Short-coupled, space-saving carrier • Full lifting capacity available on rubber—no outriggers to bother with • 2-speed transmission—can travel up to 15 MPH • Torque converter and automatic transmission • Independent travel for simultaneous hoist, swing and travel • Power steer • Full hydraulic controls.

A complete line of conventional, long wheel base Self-Propelled models also is available in the Lorain line. Available from 10 to 75-ton capacities, in single-engine and twin-engine types. 2-, 3- and 4-axle carriers available.

**The Thew Shovel Co., Lorain, Ohio**

## *Will your new shovel-crane stay up-to-date?*

If you haven't bought a machine backed by a sound, progressive parts program, it quickly can become out-of-date, less efficient than your competitors', more costly to operate, robbing you of jobs and profits as newer, more modern models are produced.

If you buy a Lorain, you can look to Lorain to protect your investment by providing specially selected "Parts Kits" to enable you always to bring your machine up-to-date to match current production designs and improvements . . . to enable you to convert a complete assembly from an original design to another of a more modern design or purpose . . . to save you money when replacing assemblies or subassemblies. Lorain Parts Kits frequently will cost you less for an entire assembly than for the replacement of a few parts.

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Printed in U.S.A.

ditch that followed the outer edges of the excavation and led to a deep sump was used to get rid of excess water. Water collecting in the sump was pumped to a drain in the street. The open ditch was later converted into a 4-inch tile bleeder drain, and the sump was converted into a 4-foot-diameter, 23-foot deep well that supplies cooling water for the compressors in the structure's air-conditioning system.

#### Waterproof basement floor

The foundation of the building consists of reinforced-concrete pads poured monolithically with the basement floor; to prevent ground water from penetrating this floor, the contractor placed three plies of felt, sandwiched between four moppings of hot pitch, on top of a 2-inch layer of concrete. The remaining foot of the basement floor was poured on top of this membrane. Construction joints in the floor were waterproofed with a rubber gasket sealer to further insure that the basement would remain dry. The felt and pitch waterproofing of the outside walls was protected by a layer of 1-inch-thick asphalt-impregnated Celotex.

The 12-inch-thick double-reinforced basement walls were formed with Uni-Form panels, ½-inch-thick plywood faced units averaging 2×3 feet in size. The 5,600 cubic yards of concrete for the entire job, furnished by Milne Ready-Mixed Concrete, Inc., Boulder, in Jaeger mixers mounted on International trucks, was placed for the basement walls and floor by a crane with a 50-foot boom and 1-yard bucket.

#### Forming columns, slabs

The 3,000-pound, 28-day test concrete was specified for the floors and 3,750-pound concrete for the columns. Concrete for the upper floors was dumped by truck mixers to a ½-yard bucket on an Archer hoisting tower and lifted to a manually operated hopper on the floor being formed. Jackson buggies, filled at this hopper, brought concrete to the point of placement. The hoisting tower was equipped with two lifts and a Chicago 20-foot boom, and a General Electric 30-hp motor drove the 3-drum hoist.

The 151 round columns of the building were formed in Sonotubes, the largest of which were 32 inches in diameter and 25 feet high for the four columns that rise from the first to the third floor. As concrete was placed for the columns, it was vibrated by a Dart electric vibrator so that a satisfactory finished surface was obtained. After a 14-day curing period, the Sonotubes were stripped from the columns. Columns were on 29-foot 6-inch centers east and west and 20-foot centers north and south. Connecting the latter columns were reinforced-concrete beams, averaging 20×14 inches.

The 12-inch-thick floor slabs were formed around 8-inch diameter Sonovoids, laid on 10-inch centers so that a minimum of 2 inches of reinforced concrete covered them above and below. A 20-inch wind bent of reinforced concrete, running east and west between column locations, provides additional strength against high winds.

As concrete was poured for the floor slabs, it was consolidated by a Dart electric vibrator and struck off by screed bars set on Richmond adjustable screed chairs. Hand finishing of the slabs was supplemented by a Mall rotary finisher. The surface of the slab was sprayed with Hunt Process Clear and the concrete allowed to set up sufficiently so that it could be covered with a 2-inch layer of sand and kept wet for seven days.

#### Personnel

The new building, which will have office space for an insurance company and other firms, together with space for a department store, radio station, and helicopter landing area, was designed by James M. Hunter of Boulder. Throughout the job, the forming and pouring crew was relatively small, averaging about 20 men. During this time, a safety supervisor was employed by the contractor, Jack H. Cys Construction Co. Cys, who spent a considerable amount of time personally supervising the work, had Ray Dahl as job superintendent and Wayne Gardner as job foreman.

THE END

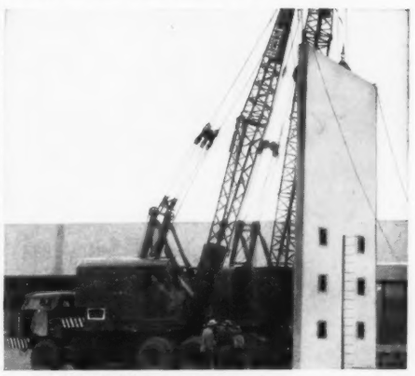
## Cummins Engine Co. opens Scotland diesel branch

Cummins Engine Co., Inc., of Columbus, Ind., has announced the establishment of a plant for the manufacture of Cummins diesel engines at Shotts, Lanarkshire, Scotland. The new firm, to be known as Cummins Engine Co., Ltd., will be a subsidiary of the Indiana company.

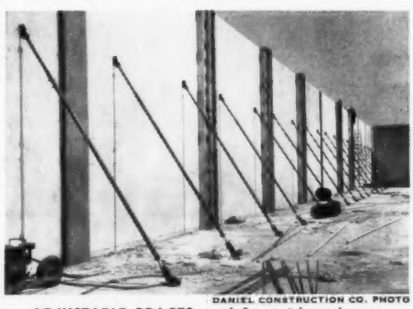
The new plant will be housed in a modern one-story factory building, containing approximately 150,000 square feet, which has been leased in Shotts. The company plans to begin production in 1957, and to be in full operation in two years. Most of the machinery required by the plant will be purchased from sources within the United Kingdom.

The new firm will establish a sales and application engineering office in Great Britain to handle the distribution of Cummins products to equipment manufacturers in the United Kingdom and Europe. D. J. Cummins, a director and vice president of engineering at Cummins, will be in charge of operations at the new factory.

**PANEL** with large window areas



**57 TON SLAB** being positioned



DANIEL CONSTRUCTION CO. PHOTO

**ADJUSTABLE BRACES** used for quick and easy alignment of panels

**WAREHOUSE**

DANIEL CONSTRUCTION CO. PHOTO

# Tilt-Up Costs Go Down

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When an outstanding Tilt-Up job rates an article in a construction publication you can be almost certain that SUPERIOR products were used. The reason is simple. SUPERIOR, as the pioneer in this field, developed designs that were thoroughly tested both in the laboratory and the field to assure safety with economical prices and low application costs.

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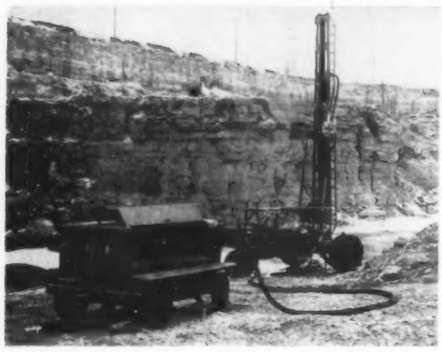
SUPERIOR "PICK-UP" INSERTS . . . ANCHORS FOR BRACES . . . ADJUSTABLE BRACES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 484



This compressor is properly balanced and in location where the air is clean. The rubber hose, installed between the receiver and the connection to the drill's head, assures the correct degree of pliability, thereby eliminating pressure drop.

# Maintenance, inspection tips for longer air-compressor life

Regular 300-hour inspections of a portable air compressor will eliminate downtime, production losses, and cut maintenance costs for a contractor, if they are thorough.

All important components, such as the fuel tank, cooling system, clutch, and air receivers, should be looked over at inspection time if the compressor is to operate at peak efficiency. If all parts of the machine are checked regularly, and care taken in eliminating pressure drop, locating the site for the compressor, making proper compressor connections, and fueling the equipment, the unit will be assured of longer life.

Fuel for a compressor should be selected on the basis of quality, rather than price. A high anti-knock rating will not necessarily guarantee a good grade of gasoline. Blended gasolines, made with a cheap base stock to obtain the specified gravity, usually contain dirt and other foreign matter, which cause valve sticking and carbonizing.

Diesel fuel should be a distilled oil of the proper gravity and octane rating. If possible, it is advantageous to purchase the fuel from the companies familiar with compressor engine requirements, as foreign matter, which clogs injection pumps and nozzles, will not be found in their fuel.

Air, oil, and diesel filters and screens cleaned once a week will protect the engine from grit and other impurities. By keeping the fuel tank clean at all times and full during cold weather, water condensation on the inside of the tank will be eliminated and water will not be able to work into the carburetion system.

On most compressors, the clutch is standard equipment, designed to reduce the torque when starting the engine. From a maintenance standpoint, the clutch should always be engaged or disengaged quickly and positively. Slipping the clutch, a method used to bring the engine up to speed gradually, will result in permanent damage to the part.

### Pressure drop

Air-tool activity is handicapped or completely stopped when pressure drops. This can be eliminated by carefully selecting the size of the hose or pipe carrying the air from the compressor to the point of use. It is important to guard against entanglement, trucks or heavy equipment running over the lines, or any heavy objects falling on the hose.

Several compressors are often connected to one common air discharge line when a large volume of air is required for one job. In such cases, the contractor should avoid using a rigid steel-pipe connection between the common discharge header and the receiver on each individual portable unit, as a rigid connection frequently ruptures the air receiver. A flexible connection, such as a piece of rubber hose, installed between the receiver and the connection to the header or

# Multiplies muscles–*speeds by*

COUNTRYSIDE, U.S.A. – from Cape Cod to the Golden Gate, from Mackinac to Mexicali – is being readied for the biggest "face lifting" job in history – for the great new network of turnpikes and throughways to serve the needs of an impatient motoring public.

"Operation Facelift" is underway – speeding today's byways into tomorrow's highways. And, pitting giant muscles against this tremendous task is the newest road-building equipment. For modern machines are the key to modern roads.

The *most modern* of these giant road-building machines have one point in common – TORQMATIC DRIVE. For manufacturers and contractors alike find TORQMATIC equipment works faster from first cut to final paving. TORQMATIC Converters match engine power to load demand – multiply torque for bigger "bites" with less strain. TORQMATIC Transmissions provide continuous full-power shifting–forward and reverse – for quicker completion of every job. And TORQMATIC DRIVES make every machine easier to operate, reducing the need for extensive operator training.

122 kinds of construction equipment built by 55 different manufacturers are *now* available with

Paving breakers rely on a continuous flow of compressed air. It is important, on a job like this, that hose lines do not get entangled or heavy trucks run over them, as this results in pressure drop.

***Checking air receivers, fuels, filters, and cooling systems will reduce downtime and maintenance costs for the contractor***

pipeline, will assure the correct degree of pliability.

If the compressor is located some distance from the work site, air should be transmitted through steel pipe lines to avoid excessive pressure drop.

Air receivers, to meet the ASME code for unfired pressure vessels, must be drained periodically, except when the receiver is used as part of the oil recovery system in a rotary unit. A safety valve protects against excessive pressure and should be checked regularly.

**Cooling system**

It is best to follow the manufacturer's instructions in caring for the cooling system. If possible, a good soft water should be used. When the compressor is stored for a long period of time, it is good practice to drain the cooling system. When this is done, lubricating oil should be drained from the crankcase and rust-inhibitor substituted. After filling the crankcase with the inhibitor, it is important to operate the unit long enough to permit the rust-inhibiting oil to coat all moving parts. Oil should also be sprayed into the compressor intakes, so that all valve parts are fully coated.

If compressors are towed at a relatively high speed, the unit will be subjected to vibration and excessive wear and tear, which ultimately damages part or all of the machine. When the compressor arrives at the work site, it should be set in a level position and at a spot where the air is clean. If out-of-level operation is necessary, as in pipeline construction, the manufacturer should be consulted for the limitations of the machine.

Thin air, when drawn into a compressor operating at a high altitude, is compressed to a smaller volume than if the air intakes were at a greater density. This small volume of air delivered by the compressor lowers the operating efficiency of the tools serviced by the unit.

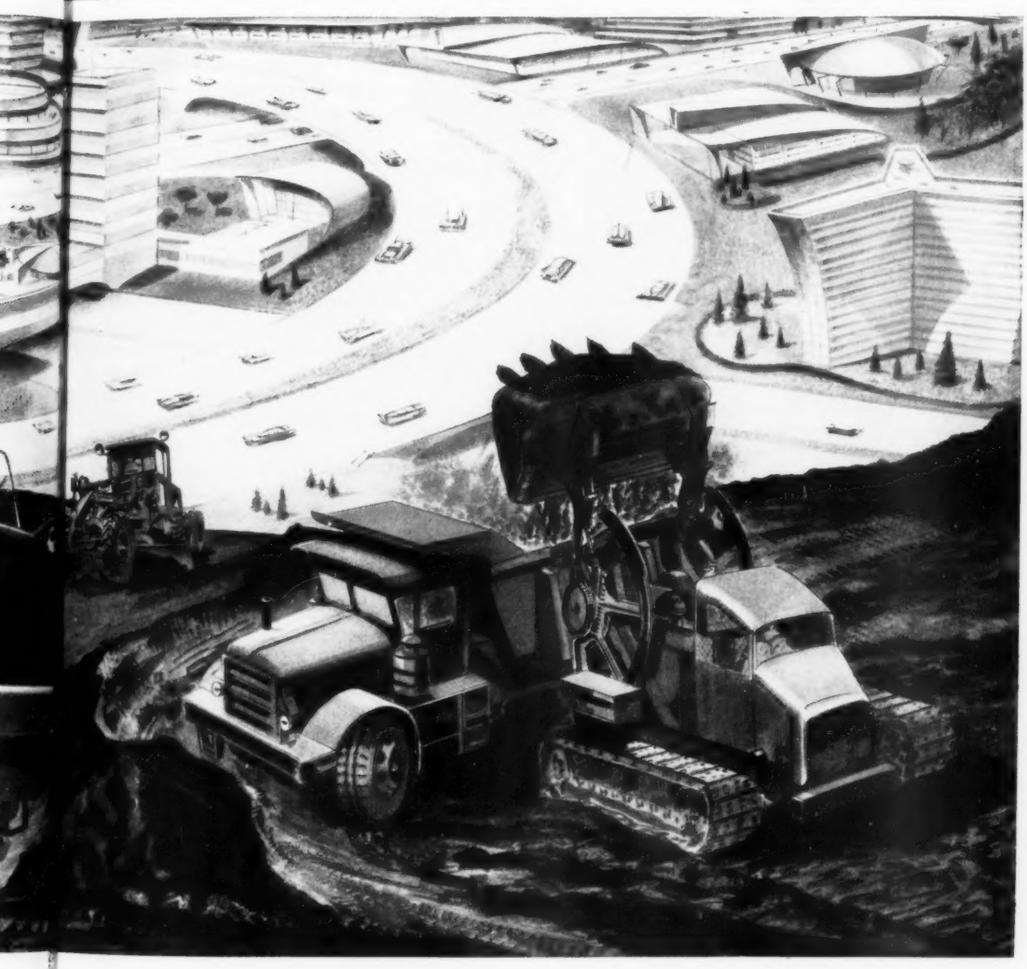
Costly compressor troubles at high altitudes can be reduced by gaging the amount of air delivered by the machine, by making allowances for it when calculating the size of the unit to be used for construction, and by keeping a constant check of all equipment. THE END

## Off-highway trucks

■ The 18 and 24-ton off-the-highway trucks recently introduced by International Harvester are detailed in a booklet from the firm. Photographs and drawings illustrate the rugged components of the Model 65 and Model 95 Payhaulers. According to the manufacturer, both models have more horsepower per struck yard than any other truck in their size class. The 18-ton rig comes with a rock body, while the larger unit takes either a rock or standard body.

To obtain Booklet CR-495-F write to the Construction Equipment Division of the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 9.

*Visit the International Harvester Co. at the Road Show in the International Amphitheatre, Booths 711 and 726.*

**byways into highways**

TORQMATIC DRIVE. You'll see many of them on display at the ARBA Show in Chicago. And, we'll be looking for you at the Allison TORQMATIC Display, too, where we'll show you how TORQMATIC DRIVES can give your equipment *new utility—new efficiency—new economy*. For further information, write: Allison, Division of General Motors, Box 894C, Indianapolis, Indiana.

**See you at the ARBA Show, Chicago, January 28 through February 2**

Allison
TORQMATIC DRIVES

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 485

A GMC truck, carrying a Rex 5½-yard transit mixer, backs up a ramp to the Rex 200 single Pumpcrete. This machine, here working on the ground at the end of the south approach, pumps concrete 40 feet to the deck above for crews of Johnson-Greene Co., Ann Arbor, Mich.

# Pumps and power buggies place concrete for Mackinac deck

***Joint-venture contractors work from both ends to build trestles and lay concrete deck***

Using a combination of transit-mix trucks, crane and bucket, Pumpcrete, and power buggies, two contractors working as a joint venture are building the concrete deck and concrete approach viaducts for the Mackinac Straits Bridge. The work includes a 6-inch concrete deck 54 feet wide on the 10,247 feet of the north and south approach trusses, together with concrete trestles at both ends of the big bridge.

Although the work was bid as a joint venture by Johnson-Greene Co., Ann Arbor, Mich., and Louis A. Garavaglia, Centerline, Mich., the two contractors have actually split the operations so that each is working on one side of the suspension bridge. Garavaglia is building the deck for the north approach, together with the north approach viaducts and the lightweight concrete fill for the steel grid deck of the suspension portion of the bridge. Johnson-Greene has the deck for the longer south approach, together with a concrete viaduct and a grade separation in Mackinaw City.

All of this work, scheduled to be continued this summer and completed by November, is included in the general deck paving contract as a part of the work done for the Mackinac Bridge Authority. The design of this work and supervision of construction are handled for the Bridge Authority by D. B. Steinman, New York City. Additional construction, including a realignment of several state highways leading to the bridge from the south and a grade separation where they intersect, is being done by Johnson-Greene Co. under the supervision of

Men work from the top chord of the truss to set deck forms, which are supported on joists hung from the steel stringers on National beam saddles.


"First time I ever used Armco Piling ...but it drove fast and straight"

So said Mr. F. R. Brown, project superintendent for H. G. Smith, contractor of Fitzgerald, Georgia. He was speaking in regard to Armco Welded Steel Pipe Piles that were used in replacing three county bridges on Georgia's State Route 119.

All three bridges, totaling 1500 feet in length, utilize the same basic design —bents consisting of four Armco Pipe Piles capped by a concrete beam. The two outside piles were driven on a 1½ to 12 batter while the center two piles were vertical. All of the piles were driven with a drop hammer on fixed leads.

**Armco Piles Have Many Applications**

Armco Pipe Piles are economical and efficient for bridges on superhighways as well as county roads. They are also widely used for foundations of buildings and other structures. You will find the right wall thickness, diameter and length for every foundation job.

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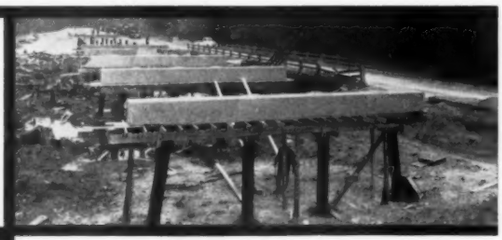
**Bridge No. 1** Armco Pipe Pile bents are almost completed for this 389-foot bridge. Old bridge at right.



**Bridge No. 2** Armco Pipe Piles are ready for next step in building this 683-foot-long bridge. Note old bridge.

**Bridge No. 3** As with the other bridges, this 424-foot-long structure has outside piles driven on a batter.

Contractor: H. G. Smith, Fitzgerald, Georgia

Georgia State Highway Department:
Resident Engineer, L. B. Ackerman
Project Engineer, J. I. Moore

ARMCO PIPE PILES

ARMCO®

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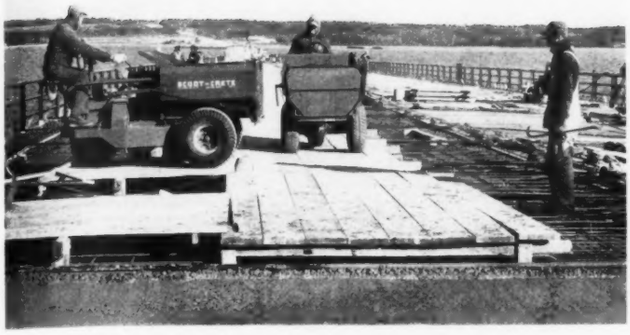

On the opposite side of the bridge Louis Garavaglia, Centerline, Mich., has Getman Scoot-Cretes bring concrete to paving crews. The maneuverable one-man-operated rigs, which turn in their own length, make up to 15 mph.

Concrete for the south approach is picked up at the Butler plant by transit-mix trucks. The plant has a 500-barrel cement bin and 50-yard aggregate bin. The Curtis compressor, foreground, supplies air to plant vibrators.

the Michigan State Highway Department.

#### Four-lane roadways

On the north and south approach truss sections of the bridge, the deck consists of two 23-foot roadways. This 6-inch concrete slab, spanning between the steel stringers, will be surfaced with 1½ inches of asphaltic concrete. The roadways are separated by a 2-foot-wide median, raised 4 inches above the finished surface of the deck. On either side is a 3-foot sidewalk separated from the roadway by a 6×10-inch curb. The steel railing on both sides of the bridge attaches to the structural steel.

The roadways have no crown, but they pitch at a uniform slope of ⅛-inch per foot from the median to both curbs. Scuppers at the curb lines collect water and discharge it through the deck. Longitudinal grades on this portion of the bridge range from about 1.17 to 2.5 per cent.

The south and north approach viaducts consist of 14 spans each. The north approach bents are concrete columns founded on H-piles and having a concrete cap. Those on the south side are founded on rock or are spaced footings on firm material. Rolled steel girders bridge the 42-foot spans between the bents and support the concrete deck, which is roughly similar to the deck on the truss spans. These trestles bring the roadway down from the ends of the bridge to the grade of the natural ground at both ends of the structure.

#### Pump concrete

Johnson-Greene Co., working on the south approach, has set up a system for placing the deck concrete that is based on a Rex Model 200 single Pumpcrete machine. With the system, transit-mix concrete is being pumped as much as 1,185 feet from the Pumpcrete machine to the point of placement.

Concrete batching is being handled in Mackinaw City, about half a mile south of the end of the bridge, by a plant consisting of a Butler cement batcher with a storage capacity of 500 barrels and a Butler 50-yard, 2-compartment aggregate bin. A crane with a Page ¾-yard clamshell bucket charges the aggregates into

*(Continued on next page)*

For more facts, circle No. 487→

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new pumps

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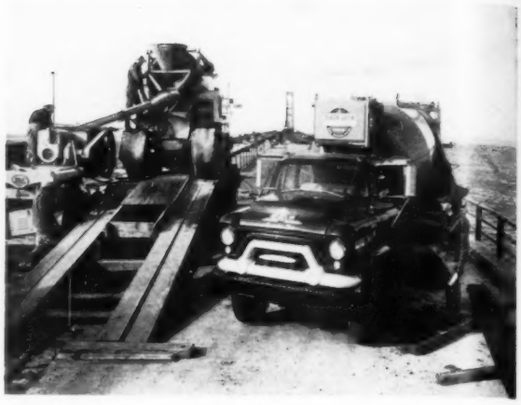
BIG NEWS IN TRUCK MIXERS

BRIDGE BUILDERS' MIXERS

Yes 704

Booth 704

Concrete is vibrated by a Master mechanical vibrator. The Pumpcrete line, on steel post mountings in the median, is swung to the center of the 23-foot roadway as an intermediate section is poured.



Working on the deck, the Pumpcrete machine is fed by Rex 5½-yard mixers mounted on GMC 550 trucks. The wooden ramp used by the transit-mix trucks can be moved ahead with the Pumpcrete machine.

*(Continued from preceding page)*

the bin. Batches are weighed out into three Rex 5½-yard transit mixers mounted on GMC FW550 tandem-axle trucks that haul to the bridge.

At the start of work, the Pumpcrete was set up on the ground at the end of the bridge and the 8-inch pipe was run up onto the deck, extending farther and farther out as placement proceeded. Concrete had to make a vertical lift of almost 40 feet and be pumped a maximum of 720 feet along the deck before the Pumpcrete machine was moved.

When concrete placement was to be continued beyond this reach, the Pumpcrete machine was moved onto the bridge deck already cast and the pipe was extended along the deck. Then the contractor built a timber and steel trestle ramp so that the mixer trucks could get to the Pumpcrete machine, 40 feet above the ground. As concrete placement advanced to a point where the pipe line was about 1,000 feet long, the pump and truck platform were moved ahead to a new location.

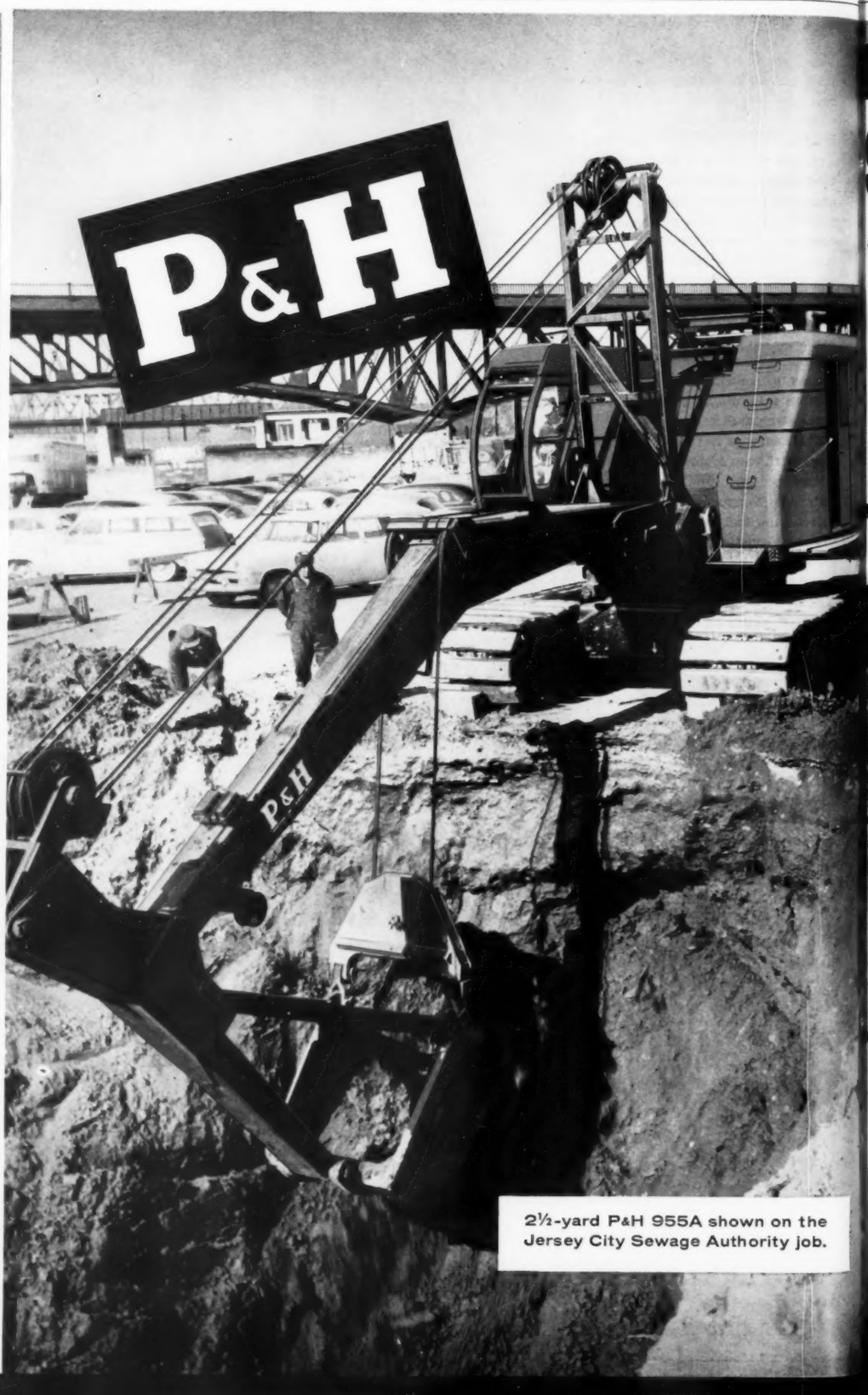
Erected by a crew with a crane on a Maxi rubber-tire mount, the trestle consists of 14 timber bents supporting steel stringers that carry the plank floor. The 246-foot-long trestle has a 12-foot-wide roadway bounded by 14-inch wheel curbs and a 3-foot walkway on one side.

The loaded transit mixers drove up the ramp, onto the deck, and then out to the Pumpcrete. Here, they climbed a short ramp to a platform and discharged the concrete into the Pumpcrete hopper. The discharging platform, like the ramp, could be moved ahead whenever the Pumpcrete setup was moved.

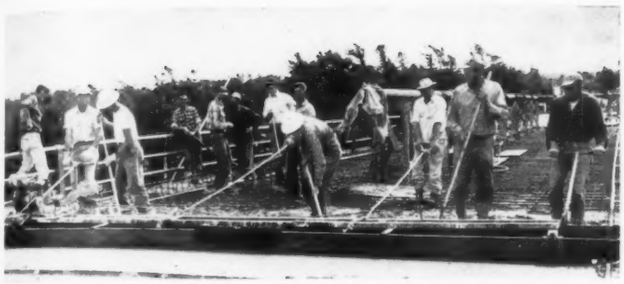
Since the bridge is made up of continuous trusses, the deck had to be placed in half-width sections, ranging from 80 to 160 feet long. These sections were placed in a predetermined sequence, rather than one section after another. Though this made it necessary to skip some sections and come back to them later, the arrangement of the concrete pipeline made the shifting simple and convenient.

The main pipeline, laid straight down the center of the bridge, was supported about 5 feet above the deck by pipe standards set in the concrete of the median. At the section to be cast, the pipe was disconnected and offset to the center of the roadway being placed by a big reverse bend. Then the pipe was strung on temporary wooden horses to the center of




2½-yard P&H 955A shown on the Jersey City Sewage Authority job.



Four workmen handle the Whiteman twin oscillating screed used to strike off the concrete. In the background is a section of the Pumpcrete line that has been swiveled to this half of the roadway.

the section being placed.

Concrete placement started at the end of the section most distant from the pump. As work progressed, sections of pipe were removed. At the end of the section, all the temporary pipe had been removed. The pipe was then reassembled on the center supports, making the system ready to pump ahead to another section.

As the concrete flowed from the end of the pipe, it was distributed across the half-width of the roadway by a swivel chute. The mix was worked down around the reinforcing with a Master mechanical vibrator and struck off with a Whiteman double-screed reciprocating strikeoff. Since this surface was to be covered with bituminous surfacing, it was not troweled. Servicised resin-base curing compound was applied with a hand spray.

#### Deck forming

Deck forms were suspended from the steel stringers by National beam saddles. These wire fasteners held the ends of the 2×6 joists that spanned between the stringers and supported the ¾-inch Plyform decking. Longitudinal screeds of 1¼-inch pipe were supported on National screed supports. One screed was set near each edge of the roadway, and the Whiteman strikeoff spanned between them.

With operations spread along a great length of deck at all times, transportation of materials was always a problem. Three Monroe Concrete Truks proved very useful for moving such items as plywood, lumber, form hardware, nails, and small amounts of concrete from place to place on the deck.

Arrangements were made with the bridge painting contractor, J. I. Hass Co., Inc., Jersey City, N. J., to strip the deck forms from the painting scaffolds. This made it unnecessary to erect special scaffolding under the deck for form removal.

#### Deck for north approach

At the opposite end of the bridge, Louis Garavaglia is building a similar deck with methods that are a little different. Concrete is being batched from a Butler plant consisting of a 250-barrel cement batcher and a 50-yard, 2-compartment aggregate bin. Bins are charged by a Bay City mobile crane with an Owen ¾-yard clamshell bucket.

Batches are discharged into two Worthington 6-yard transit mixers mounted on Mack B-42 trucks, which mix the concrete and deliver it to the end of the bridge. Here a Bay City crane using a 1-yard concrete bucket hoists the concrete to a 6-yard hopper at the end of the deck.

Scoot-Crete 14-cubic-foot power buggies pick up the concrete from the hopper and deliver it to the section being poured. As at the south end, the

A Jackson vibrating screed strikes off concrete delivered to Garavaglia crews by the power buggies. The screed spans 1½-inch screed pipes, supported on Superior screed supports that run the width of the slab.


# 9¢ a cu.yd...283½ yds.an hour*

## with 2½ yd. P&H "Job-Designed" Trench Hoe

Each year more and more contractors are upgrading their equipment to the greater speed, power, accuracy and profitability of P&H "job-designed" power cranes and shovels.

The P&H 955A, pictured at the left on the Jersey City Sewage Authority job, digs 283½ cu. yds. an hour at a cost of 9¢ per cu. yd. (depreciation excluded) for the LaFera Contracting Company, Newark, N.J.

There's good reason for this typically profitable P&H performance. With the 955A it begins with Magnetorque†—the simplest and most advanced power drive known. Magnetorque transmits power for swings electro-magnetically—without friction, without wear. Swings are smoother, more easily controlled—and from 15% to 25% faster.

In addition to Magnetorque, you get P&H greater stability for more power at the tooth point—rapid reversing chain crowd for snappier dipper action—direct hydraulic control for smoother, easier control. This combination of outstanding P&H features gives the 955A the power, speed and flexibility to get the best performance out of your best operators.

Call your P&H dealer soon. No matter what the capacity needs or nature of your job, he can show you a P&H model that will help you dig more and lift more at a lower cost. Harnischfeger Corporation, Construction & Mining Division, Milwaukee 46, Wisconsin.

†T.M. Harnischfeger Corp. for electro-magnetic type coupling.

THE P&H LINE Truck Cranes: 8, 10, 15, 20, 25, 30, 35 and 40 tons Shovels: ½, ¾, 1½, 1¾, 2½ and 3½ yards

## Across the country P&H machines lead the field in power, speed, flexibility and profitable performance

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Gammino's of Providence depend on 35-ton P&H 555A-TC truck cranes for fast, economical performance in excavating on the big North-South Freeway job.

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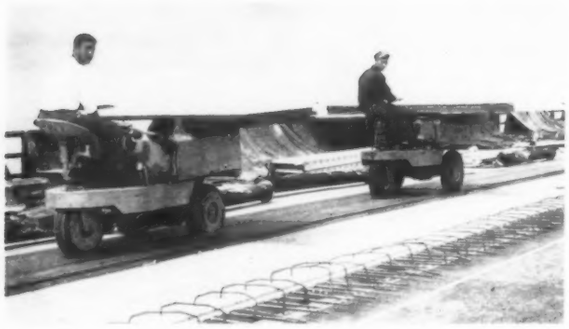

Since heavy vehicles are unable to travel the deck, the problem of moving materials to workmen on the bridge is solved by Monroe Concrete Truks.

placing sequence made it necessary to skip some sections and come back to them later, but this was no inconvenience at all for the Scoot-Crete delivery system.

As the concrete is dumped from the power buggies, it is worked around the reinforcing by Maginniss Hi-Lectric vibrators and struck off with a Jackson vibrating screed. Instead of running the 1¼-inch screed pipes along the length of the slabs, Garavaglia is placing the pipes on Superior screed supports across the width of the sections at 11-foot spacings. The 12-foot Jackson vibrating screed spans the pipe screeds. The sidewalk area, which is not to be covered with asphalt, is being screeded and troweled by hand. Curing compound is then applied by a hand spray.

The deck forms are virtually identical to those on the south approaches, the only difference being that Garavaglia is using Superior saddle hangers and other form hardware. Since the floor thickness has to be not less than 6 inches and not more than 6¼ inches, it is particularly important that the form at each edge of each span be carefully shimmed to just the right elevation.

#### Approach trestle

The approach trestle at the north end of the bridge is being built on the existing mole, which was constructed a number of years ago. To support the trestle bents, 14-inch 117-pound H-piles were driven down through the earth core of the mole to bearing on solid rock by a crane with a McKiernan-Terry 11-B-3 steam hammer. Steam was supplied by a Cleaver-Brooks quick boiler.

Concrete footings, columns, and caps were formed with wood forms and poured by the crane-and-bucket method. After rolled steel beams, continuous over four spans, were set to bridge the 42-foot spans between piers, deck construction proceeded, similar to that on the truss spans.

Next summer, when the stiffening trusses and deck system of the suspension bridge are being placed, Garavaglia will place the lightweight concrete fill in the steel grating floor. While the volume of this concrete is small, the placing schedule is tight, and the work must be carefully planned if the bridge is to be opened to traffic in the fall as scheduled.

#### Highway realignment

South of the bridge, highways U. S. 31, 23, and 27 are being reconstructed on a new alignment to meet the south approach to the bridge and to bypass the Mackinaw City business district. Under a separate contract with the Michigan Highway Department, Johnson-Greene Co. is constructing a substantial portion of this new road.

Muck excavation was handled by a dragline with a Page 1½-yard bucket, while a spread of five Tournapulls handled the grading. The Tournapulls were pushed by Caterpillar D8 pushers in the cuts and borrow pits, and material was spread on the fills by Cat D6 dozers. The grading operations included the building of approach fills for two grade separations. One of these will separate the highways at their point of junction just south of Mackinaw City. The other will carry the highways over the main street of the city near the south end of the bridge.

#### Personnel

The superintendent for Johnson-Greene Co. on the several operations is Lyle Hawes. His staff includes assistant superintendent Fred Collins, Jr., field engineer Carl D. Murphy, carpenter foreman Edward Lounds, labor foreman James Raffael, and earthwork foreman William Lick.

Louis Garavaglia's field staff includes general superintendent Abe Wells, who was on the job only part of the time, project superintendent Gus Brasgalla, project engineer Charles Roarty, and office manager Max Wells.

The work on the bridge approaches and viaducts is under the direction of John W. Kinney, resident engineer for D. B. Steinman on the entire Mackinac Bridge project. THE END


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The hopper, conveyor, and spinner can be reversed as a single unit on the Shunk front-end reversible hopper-type spreader, permitting spreading in front of all four wheels or behind the rear wheels.

## Reversible sand spreader offers all-year service

■ A new highway material spreader that permits sanding, cindering, or salting in front of all four wheels and is also able to spread behind the rear wheels, for all-year service, is announced by the Shunk Mfg. Co. The Shunk front-end reversible hopper-type spreader is available with hopper capacities of from 5 to 12 cubic yards. Either an independently mounted gasoline engine or a power takeoff can be used to power the spreading unit.

According to the manufacturer, the unit-design construction permits the hopper, conveyor, and spinners to be reversed as a single unit on the truck chassis. Reversing the unit can be done by two men using jacks or a block and tackle, the company reports.

For ice control applications, the spreader, by sanding or cindering under all four wheels, is said to eliminate skidding, backing up on steep hills, or hand-spreading from the hopper in order to gain traction. The in-front-of-the-wheels spreading arrangement also permits operation up to 30 mph under icy conditions.

The spreading operation is completely visible to the operator of the vehicle when the machine is mounted for front-end spreading. This enables him to follow the operation while still concentrating on driving the vehicle. The Shunk spreader can also be used for sanding asphalt roads or spreading chips, stone, calcium chloride, and other materials.

For further information write to the Shunk Mfg. Co., Bucyrus, Ohio, or use the Request Card at page 18. Circle No. 169.

## New protective features added to saw engines

■ Several new protective features have been added to the Wisconsin engines that are used to power the 36 and 25-hp concrete saws manufactured by the Clipper Mfg. Co. Both the C-360 and the C-250 models now have exhaust valves and inserts faced with Stellite, an extra-hard metal, and valve rotators that cause the valves to turn approximately six degrees each time they are opened.

An air precleaner and a rotating screen have also been added. The precleaner traps dust and grit floating in the air, prolonging the life of pistons, cylinder walls, and bearings. The rotating screen, fastened to the flywheel, aids in keeping sludge from building up on the flywheel and in the air passages.

For further information write to the Clipper Mfg. Co., 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 153.

*Visit the Clipper Mfg. Co. at the Road Show in the International Amphitheatre, Booth 233.*

## Steel welding guide

■ A "Weldirectory" for stainless steels, non-ferrous metals, cast iron, and manual hardsurfacing is available from the Lincoln Electric Co. The illustrated manual describes the type of electrode to use for welding each of the various metals and for obtaining the desired impact and abrasive-resistance in arc-weld surfacing. For each of the metal classifications, the Weldirectory describes in detail the electrode that is recommended, discusses the properties of the deposited metal, the welding procedure, and lists typical applications.

To obtain catalog SB-1352 write to the Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 178.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 489

An easy-to-reach lever operates the direction reverser that permits the John Deere 420 tractor to reverse direction without shifting gears.

## Rig reverses direction without shifting gears

■ The John Deere 420 tractor is now able to reverse its direction without shifting gears and without reducing speed, according to its manufacturer. The company's direction reverser attachment is optional equipment.

Other new features on the 420 are an easy-to-attach foot throttle, said to increase engine and ground speeds up to 25 per cent; a five-speed transmission; a heavy-duty three-point hitch; and continuous-running power takeoff.

For further information write to John Deere Industrial Division, Deere & Co., 3300 River Drive, Moline, Ill., or use the Request Card at page 18. Circle No. 190.

## Abrasive blades designed for cutting green concrete

■ Two new reinforced abrasive blades for cutting concrete expansion joints while the concrete is still green, are announced by the Bay State Abrasive Products Co. Krete-Kut and Saf-T-Cut BZ2 blades will efficiently cut all types of aggregate in green concrete, according to the company.

When concrete slabs are cut as soon as the deck will support the saw and the operator, a well defined crack-line is established, the company points out, along which cracking will occur to the full depth of the slab thus preventing random cracking. This permits pouring in continuous ribbons.

Vutting concrete in its green state makes possible the use of these silicon-carbide abrasive blades rather than diamond blades. Though designed for wet operation, the new blades are not damaged if the water supply is momentarily interrupted.

For further information write to the Bay State Abrasive Products Co., 15 Union St., Westboro, Mass., or use the Request Card at page 18. Circle No. 134.

## Kaiser Steel appoints

Mark T. Anthony has been appointed assistant to Jack L. Ashby, the vice president and general manager of the Kaiser Steel Corp., Oakland, Calif. Mr. Anthony succeeds A. F. Scarr, who was named the assistant general manager of Kaiser Center, Inc., also of Oakland.

ELECTRONIC DEVELOPMENTS ranging from radar—including the radar used to fill gaps between long range radar sets—to custom-made radios will now be housed in the new Advanced Engineering Center of the Radio Division of Bendix Aviation Corp. Located in Baltimore, Md., the 100,000-square-foot facility provides air-conditioned space for technical and laboratory projects covering guided missiles, ground and airborne radar, aviation communications, and mobile two-way radios. The new building is connected to the main plant by a second-story enclosed passageway. A portion of the basement is an "island" insulated from the main building structure, where electronic equipment will undergo vibration tests simulating actual operating conditions.

Mounted on crawler tracks for maximum maneuverability, the G-800 Tracdril gives you the speed of a heavy drifter, the constant feed of a CP Drill Carriage, and the rapid positioning of its hydraulically actuated U-arm.

Practically a one-man tamping gang, this CP Super Triplex Backfill Tamper is a "three-legged stomper" that really packs dirt.

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Pictured in action are three of the new 1957 Series K Dodge trucks. In the foreground is the 204-hp 300 pick-up (8,800 pounds maximum gross vehicle weight) with dual rear wheels. Being conveyor-loaded is the 232-hp 900 six-wheeler with a conventional dump body (46,000 maximum gross vehicle weight). In the background is a 197-hp 600 stake model (21,000 pounds maximum gross vehicle weight).

## Truck line covers most hauling requirements

■ Increased power and load capacities, three-speed automatic transmissions with push-button driving controls, and expansion of power steering and power brakes into all model types are among the features reported for the 1957 Series K line of Dodge trucks. According to the manufacturer, the new line covers approximately 98 per cent of all hauling needs, with models to carry most economically loads ranging from 4,250 to 46,000 pounds gvw and up to 65,000 pounds gross combination weight.

The new Series K offers nine engines with 12 different horsepower ratings up to a maximum of 232. Despite increases in compression, horsepower, and torque, the new trucks are designed to operate on regular grades of gasoline, the manufacturer reports.

The four-wheel-drive Power-Wagon is now available in two models. The larger has an 18,000-pound gvw and utilizes either a 197-hp V8 engine or a 130-hp 6-cylinder power plant. Cab-over-engine models range up to 201 horsepower with 22,500 pounds gvw. Six-wheel models have a maximum of 232-hp with 46,000 pounds gvw and 65,000 pounds gross combination weight.

Low-tonnage and forward-control models of the Dodge line are available with push-button driving controls with three forward speed ranges. Two-speed rear axles are offered on models with 15,000 gvw and up, as well as on all cab-over-engine models. All tandem and conventional high-tonnage models can be obtained with three-speed auxiliary transmissions for heavy loads and off-the-road operations.

For more information on the Dodge line of trucks, write to the Dodge Division, Chrysler Corp., 12200 E. Jefferson Ave., Detroit 31, Mich., or use the Request Card at page 18. Circle No. 166.

## Pure polyethylene film protects from moisture

■ A pure polyethylene film for permanent moisture vapor protection in building construction is available from The Delta Co. According to the manufacturer, Deltafilm will not rot, is unaffected by age and moisture, is extremely lightweight and strong, and is easy to handle.

The film is also resistant to low temperatures; it will not crack at temperatures as low as minus 70 degrees F. According to the manufacturer, when Deltafilm is used under slabs no gravel or stone base is required for moisture protection.

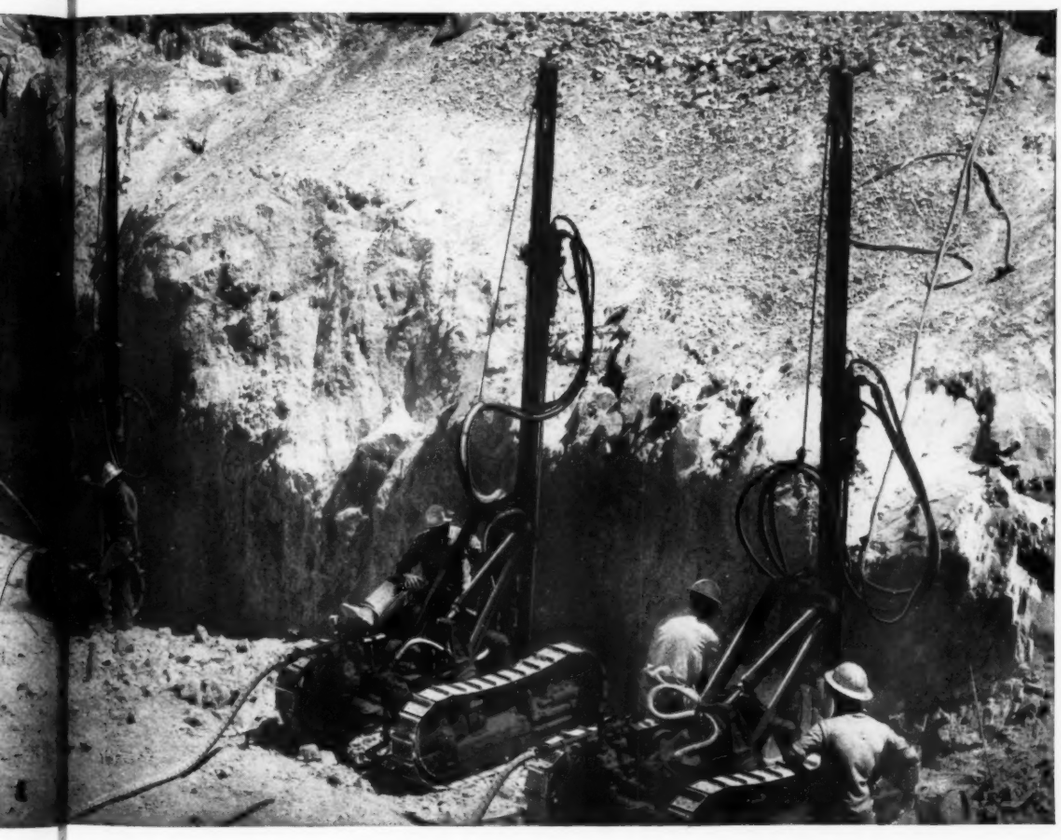
The film is also recommended for covering windows and other openings, as a tarpaulin or wind-break, for sidewall insulation, and for crawl spaces.

For further information write to The Delta Co., 333 W. 24th Place, Chicago, Ill., or use the Request Card at page 18. Circle No. 156.

## Parts catalog

■ The complete line of rotary tools manufactured by Lebus Rotary Tool Works, Inc., are described in a catalog from the company. Items detailed are load binders, tail chains, snatch blocks, swivels, springs, drill joints, pipe cutters, circulating and releasing rotary spears and liner setters, and grooving and controlled counter-balance spooling systems. Each item is described and pictured, and complete specifications are included.

To obtain Catalog 55 write to Lebus Rotary Tool Works, Inc., Box 2352, Longview, Texas, or use the Request Card at page 18. Circle No. 177.

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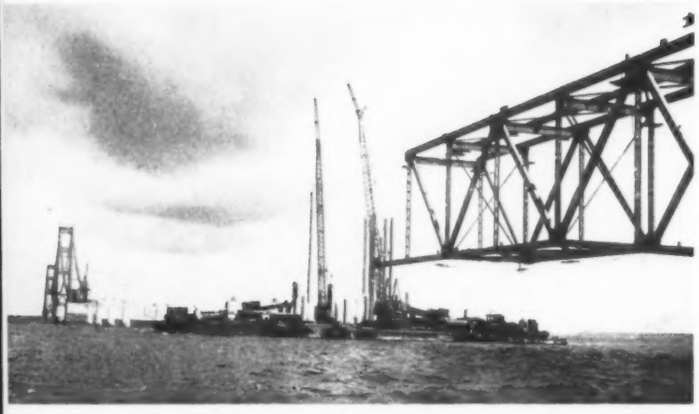

Work on this 560-foot cantilever section, the longest in the structure, is stopped as Manitowoc 3900 cranes set the falsework bent that will support the truss. Erection will continue to the bent, 320 feet out from the pier.

# All approach truss spans set from falsework bent

Though overshadowed by the spectacular cable-spinning operations on the suspension portion of the Mackinac Straits Bridge, the erection of the 28-truss span making up the approaches to the bridge was a major project in itself. This erection job was handled by floating cranes, a tower derrick, and two travelers, aided by a versatile sectional falsework bent. Completion of the 9,299 feet of continuous truss bridge was speeded by the use of high-tensile bolts for all field connections.

Sixteen spans, ranging from 160 to 560 feet in length, combine to reach 5,691.5 feet from Mackinaw City on Michigan's Lower Peninsula to the south anchorage of the suspension bridge. Another twelve spans bridge the 3,607.5 feet from the north anchorage pier to the existing mole on the Upper Peninsula side of the Straits.

### Cantilever erection method

American Bridge crews, using the cantilever erection method, carried each truss out from one of the piers, to or beyond the midpoint of the span, to be landed on a falsework bent that had been set up in advance. After jacking the truss up to grade at the falsework bent, the crew continued the cantilever erection process until the truss landed on the next pier. This operation was repeated—at both the south and north ends of the bridge—until the trusses were tied in on the anchorage piers marking the start of the suspension section.

The structural steel members for the bridge were shipped by rail to St. Ignace on the north side of the Straits. At a dock in the harbor, an Industrial Brownhoist 100-ton locomotive crane loaded the steel onto barges that were towed directly to the points of erections.

The first nine spans from the south end were erected by two Manitowoc 3900 cranes, mounted on barges, which also erected the first eight spans from the north end. Each of these cranes, together with supporting equipment, was mounted on the deck of a 34×100-foot barge. Each of the floats carried two Clyde anchor winches powered by Minneapolis-Moline engines. Other equipment included a Chicago Pneumatic 315-cfm air compressor and a Cleaver-Brooks flash boiler to power steam hammers.

Equipped with 120-foot booms and


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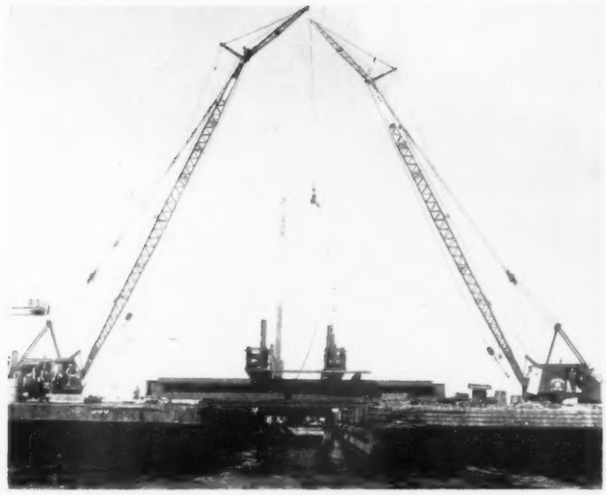
One Manitowoc, right, drives piling, while a workman who has just disconnected the line from another pile rides the bosn's chair to the deck. Floats, foreground, support the device that lowers cage sections and holds them while piles are driven.



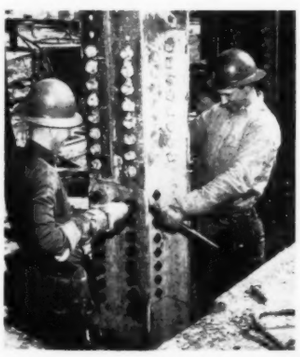
***Sectional cage and spliced piles are re-used 28 times; field connections are made with high-tensile bolts***

30-foot jibs, the cranes worked on opposite sides of the trusses to raise the steel to the high trusses. At each end of the bridge, the maximum lift was only about 45 feet, but as the cranes worked out from shore, the maximum lift increased to more than 100 feet above the water.

From this point on, it was necessary to set some of the steel with a floating tower derrick. This derrick—the same one used to set the first lifts of the suspension bridge towers—consisted of a stiffleg derrick mounted on a 60-foot triangular tower which, in turn, was mounted on a 52×100-foot barge. Operating the derrick and the anchor lines of the barges were two Clyde 3-drum hoists powered by Murphy diesel engines.

This big rig, fitted with 110 feet of boom and a 20-foot jib, set the high steel for the trusses that were beyond the reach of the cranes.

The Manitowoc cranes worked with



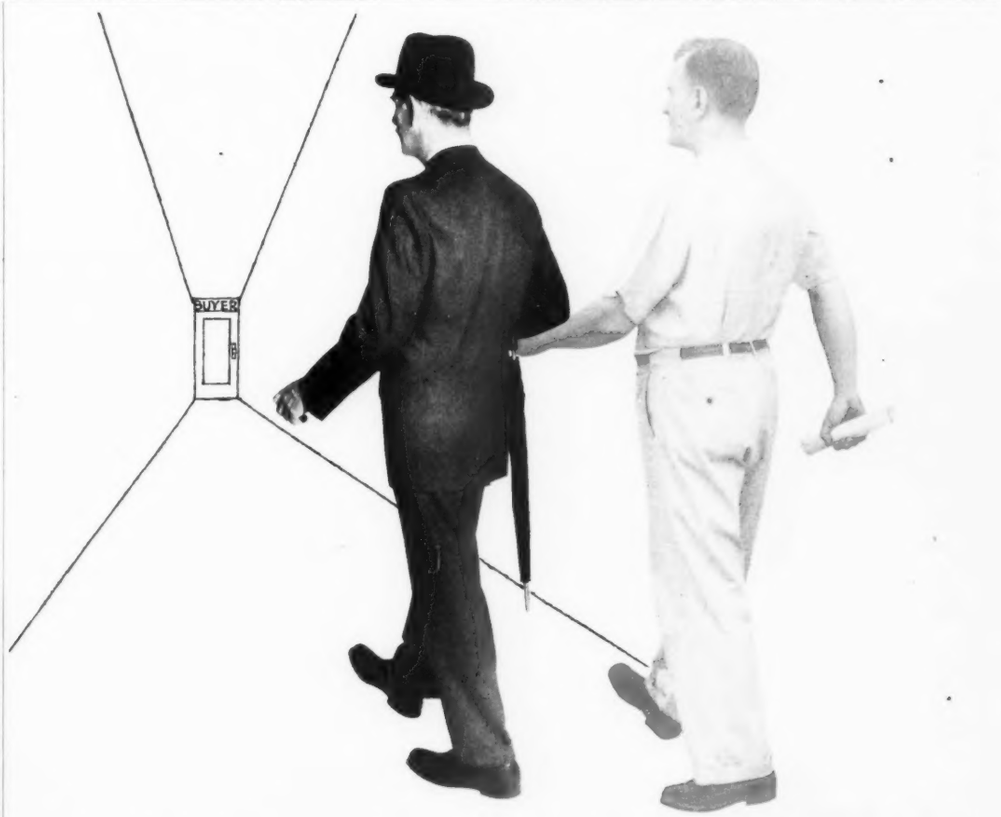
Workmen bolt the 30-foot extensions to piles with Chicago Pneumatic air wrenches powered by a 315-cfm air compressor.

the tower derrick, setting bottom chords, bracing, and other members within their reach. The maximum lift handled by the tower derrick on this operation was an 80-foot top chord member. This weighed 32 tons and was easily within the 52-ton capacity of the derrick.

### One falsework bent

In every span, regardless of height or method of erection, the versatile falsework bent played its part. The bent consisted of an underwater cage to guide the piling and keep it rigid. Grillage beams were bolted to the pil-

(*Continued on next page*)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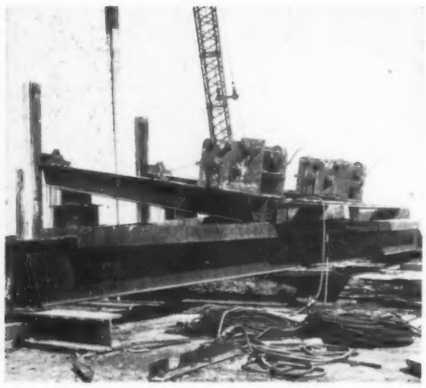
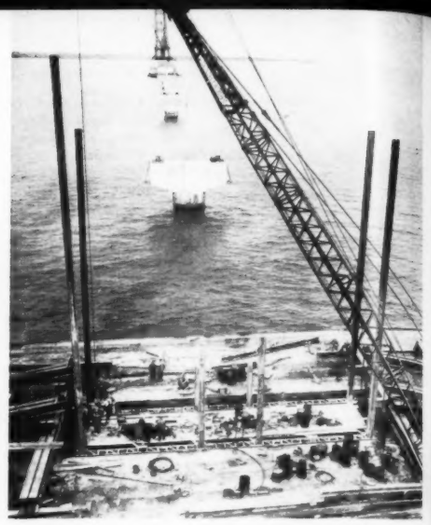


One of the cage-handling devices, which spans between the barges to support the hoisting device, consists of 36-inch beams. The 11×15×60-foot cages, through which piles are driven, are lowered, one atop the other, by Dobbie 10-ton hand winches.



Erection of the falsework bent takes place between two 34×200-foot barges. Eight 75-foot-long piles are in place in the pockets, and the first 20-foot extensions have been bolted to each. Four extensions are required to reach bedrock.

(*Continued from preceding page*)

ing above the water level, and a telescoping bent reached up to support the bottom chord of the truss.

The most difficult place where it was used was a secondary gorge at about the center of the south approach, or between piers 9 and 12. The water here was from 60 to 70 feet deep, and at the bottom was a hundred or more feet of silty clay that would not support the piling. In this area, the piles had to be driven to rock—at depths of more than 180 feet below the water surface—to support the falsework bent.

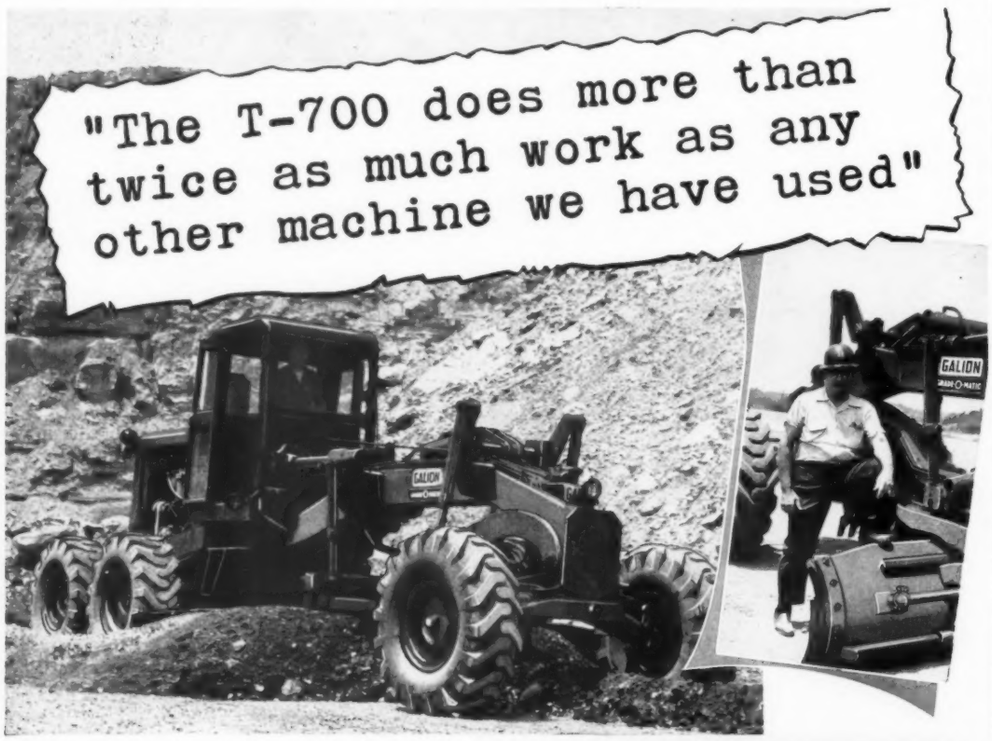
The underwater portion of the bent consisted of a steel cage 15 feet wide and 60 feet long. It was made up in sections 11 feet deep. The sides of each of these sections consisted of trusses built up of angles and channels. Around the periphery of the cage were 24 pockets for the steel H-piles. These sections were assembled, one on top of the other, to form a continuous unit corresponding to the depth of the water.

These cages, which weighed up to 100 tons when completely assembled, had to be handled by some special pieces of equipment that were carried on two 34×200-foot barges. These were set parallel to each other and had space between them for the falsework bent. Each cage-handling device mounted between the barges at each end of the bent was supported on three 36-inch beams that spanned the 50 feet between the centers of the two barges. The cages were lifted and lowered by four Dobbie 10-ton hand winches, two on each end of the rig. These winches were reeved with 10 parts of ⅞-inch wire rope running to blocks attached to the first cage section.

As the first 11-foot section of cage was lowered into the water, a second section was set on top and attached to the first. The winches continued lowering and successive cage sections were attached until the first cage was on or near the bottom. The 14-inch 87-pound H-piles were then inserted in the pockets and driven through the cages to bearing.

### Piles 195 feet long

At the extreme depths, a 75-foot section of pile was first set in the pockets. This pile penetrated a short distance into the bottom without


That's the opinion of George M. Pyle, a Mine Superintendent at Hanna Coal Company strip mines in Ohio.

According to Mr. Pyle, before they acquired the Galion T-700 GRADE-O-MATIC Motor Grader, three competitive heavy duty motor graders were being used seven grader shifts per day. Now they use only the Galion T-700 for three shifts—and with much better results. The savings are estimated to be at least $100.00 per day. Furthermore, the operators appreciate the ease of handling and performance of the Galion T-700 as compared to the graders previously used. The other motor graders are no longer being used for this extremely heavy work.

Grader service in strip mining is plenty rough — rougher than usually encountered on construction work. What Galion GRADE-O-MATIC Graders do in strip mines, they'll do—with added emphasis—for you on your big highway construction jobs. Write for literature.

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Engineered balance of power and weight gives you most "PUSH-POWER" at the blade for moving more material in quicker cycles.

GRADE-O-MATIC Drive provides automatic torque multiplication as needed, absorbs load shocks, prevents engine lugging and stalling. Power-shift transmission—no foot clutch—means less operator fatigue. Engine speed automatically adjusts to meet all loads or conditions at any predetermined working or travel speed.

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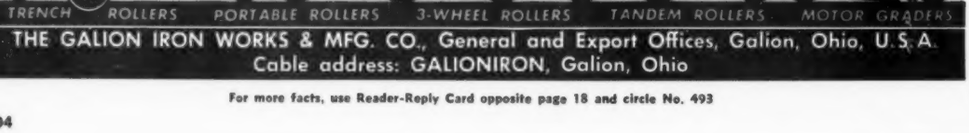


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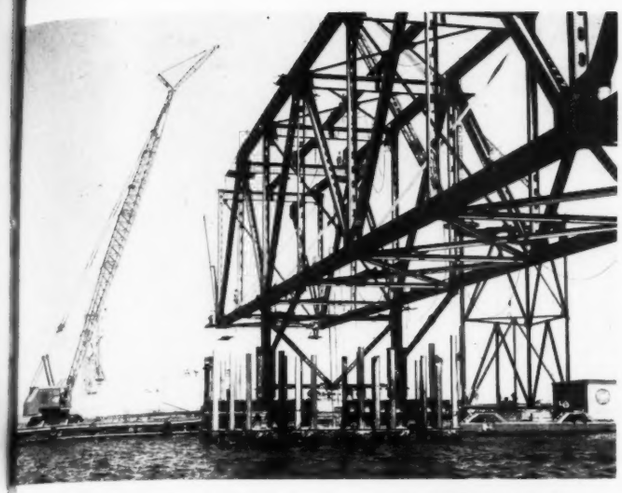
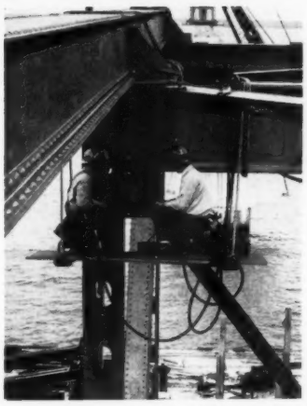


▲ The truss has been landed on the falsework bent and jacked up to grade so that steel truss members can be erected to the next pier. At left, a barge-mounted Manitowoc sets one of the diagonal members of the truss.



As soon as the trusses are erected, field connections are made with ⅞ and 1-inch high-tensile bolts and washers. ►

being driven. Successive 30-foot sections were then spliced onto the pile. Splices were made with web and flange plates bolted in place, and the Chicago-Pneumatic air wrenches that speeded the bolting job were also used for the fast dismantling of the splices later on. As splices were made, the pile was driven through the silty clay of the bottom to bearing on solid rock by McKiernan-Terry 10-B-3 double-acting steam hammers powered by Cleaver-Brooks flash boilers. In the deep spots, four of the 30-foot sections were added to make the piles 195 feet long.

When all the piles were in place, grillage beams were bolted between them to support the superstructure of the falsework bent. All the piles had four rows of holes punched in the outstanding legs of the flanges so that the grillage beams could be attached

*(Continued on next page)*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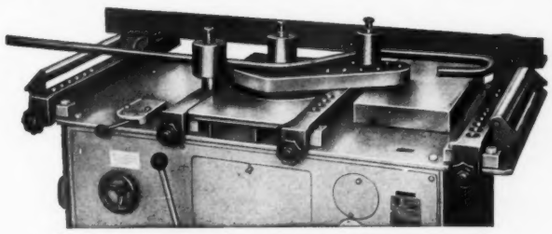

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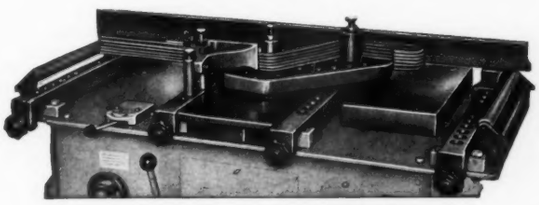

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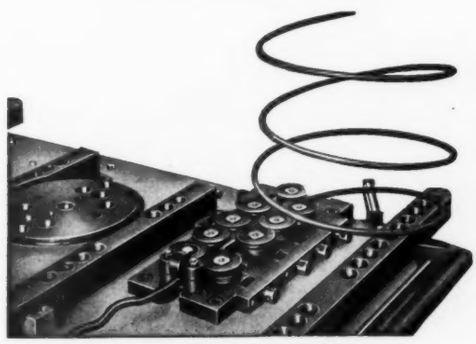

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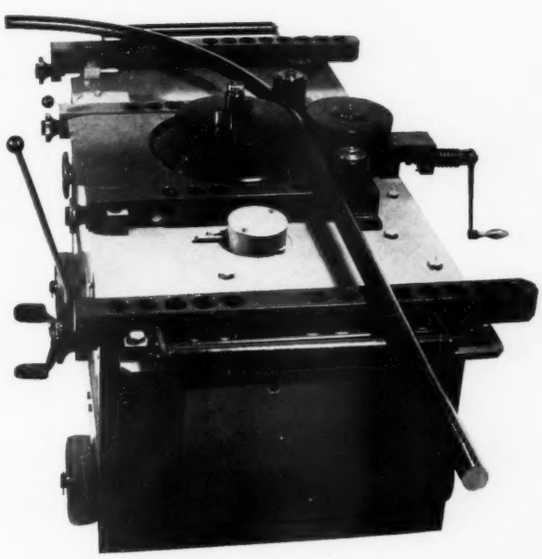

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**ALBERT KLINGELHOFER**
MACHINE TOOL CORPORATION
INDUSTRIAL PARK KENILWORTH, NEW JERSEY

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An American S-3 traveler with 100-foot boom places stringers in the deck of the truss. The rig did not begin to work on a truss span until it had been landed on the next pier.

A big tower derrick—a stiffleg mounted on a 60-foot triangular tower that is carried by a 52×100-foot barge—sets steel floor-beam brackets on the south backstay span, which cannot be reached by the barge-mounted crane.

(*Continued from preceding page*)

at any point on the piles and adjusted to grade. The telescoping bents were made up of compound columns, consisting of rolled sections braced with latticed channel members.

The bent was fitted with four 500-ton jacks that raised the truss to proper grade after it had been landed on the bent. Erection of the truss was then continued on to the next permanent pier. When the truss was in place on this pier, the falsework bent was removed, being no longer needed, and erection of the truss progressed into the next span.

The superstructure of the bent was dismantled with the aid of a barge-mounted Manitowoc 3900 crane. Then the piling was pulled by a Vulcan 1200 extractor and the cages hoisted back out of the water by the cage-handling devices. Cage sections were removed one by one as they came to the surface. The barges were then towed to the desired point in the next span and the bent was reset. Setting and removal of the complete bent required from two to four days.

#### Traveler sets stringers

Working one span behind the truss-erection crew, another crew used an American Bridge S3 traveler to set the stringers and other second-pass steel in the floor system. With its 100-foot boom, the traveler picked up the steel from barges, raised it to the deck and set the pieces in their proper places. The traveler moved out along the deck under its own power, but never ventured out on the truss spans until they had been landed on the next pier.

#### High tensile bolts

All field connections for the approach spans were made with high-tensile bolts and washers instead of rivets. The selection of the method—left to the discretion of the contractor—was made because of the shortage of skilled riveting crews. The big towers of the suspension bridge are all riveted, and riveting crews were busy completing their jobs on the towers during much of the time that the approach trusses were being erected.

Bolting crews used Chicago Pneumatic impact wrenches to tighten the more than a million bolts to proper

One of two Manitowoc Model 2000 25-ton cranes used by Foster-Wheeler during erection of Murray Gill steam generating plant for Kansas Gas and Electric Co., Wichita, Kansas. Crane raised sections for 110' x 10' diameter smoke stacks with 85' boom.

***"...absolutely no maintenance in a year-and-a-half..."***

***Manitowoc crane is "perfect"***
**. . . says Field Superintendent**

"As far as Manitowocs are concerned, I'd rather use them than any crane I've come in contact with!" That's Mr. S. C. Townsend, a Field Superintendent for the Foster-Wheeler Corp., referring to a 25-ton Manitowoc Model 2000 crane he uses — one of 30 Manitowocs owned by Foster-Wheeler. Here's more sincere praise Mr. Townsend has for Manitowoc cranes . . . "They never have given us any trouble. My operators say they are the easiest on the market to operate. Manitowocs seem to have plenty of horsepower for anything we attempt to do. One of the 2000 machines has had absolutely no maintenance on it, except to change oil, in the year-and-a-half we have owned it. It has been perfect. I appreciate the fast, courteous service I get from Manitowoc."

Why not put a Manitowoc to work on *your* next job? A phone call to your helpful Manitowoc distributor will bring full details and specifications. Contact him *now* before your next important bid!

**Manitowoc Engineering Corp. Manitowoc, Wis.**

***"...easiest to operate..."***

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***"...plenty of horsepower..."***

Simplicity of main machinery design adds horsepower where it's needed. Just 13 gears and pinions in the Model 2000 machine . . . only working gears turn. Exclusive sliding pinion arrangement uses only one set of clutches to drive travel, swing and boom hoist.

***"...never any trouble..."***

Finest quality construction with special alloy steels used at all points of greatest wear. Maintenance is easy for simple servicing in the field with minimum downtime.

***"...fast, easy convertibility..."***

Conversion to 1¼-yd. shovel and trench hoe, and long-reach dragline is quick and simple with same back hitch arrangement. Except for drum laggings, all changes need only pin connections.

MANITOWOC

SHOVELS 1-5½ YD. Speed Crane CRANES 20-100 TON

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torque for all the field connections. A close check of the bolting, made with Skidmore-Wilhelm calibrators on impact wrenches kept the torque between maximum and minimum limits. On ⅞-inch bolts, the minimum limit was 400 foot-pounds and the maximum 600 foot-pounds. On the 1-inch bolts, the minimum and maximum figures were 670 and 1,000 foot-pounds, respectively.

**Personnel**

Crews of Merritt-Chapman & Scott Corp., New York City, which constructed the massive concrete piers for the approach bridges, were followed by American Bridge Division crews erecting the approach trusses under the supervision of superintendent V. A. "Vic" Vogel and senior field engineer A "Art" Hubbard. The concrete deck is being placed by a joint venture of Johnson-Greene Co., Ann Arbor, Mich., and Louis A. Garavaglia, Centerline, Mich. (See page 94.) The project manager for the entire project is D. C. Kline. THE END

## Scale attachment weighs loads as they are lifted

■ A scale attachment that weighs loads as they are lifted is available from Hydroway Scales, Inc. The Hydroscale has a lifting eye that permits it to be used with any standard crane or hoist. It is recommended for use when lifting loads that must be weighed and as a positive means of preventing overloading.

Said to be accurate to .5 per cent of the maximum dial capacity, the Hydroscale is available in 110 models with capacities of from 500 to 200,000 pounds. Dials are offered in three sizes: 12, 24, and 30 inches. All models are furnished with tempered dial safety glass, said to be equal in impact resistance to 1½-inch-thick plate glass. The hydroscale does not interfere with the operation of safety stop blocks on crane hoisting lines. It is available with an angled face for ease in reading from ground level, and in metric gradation if necessary.

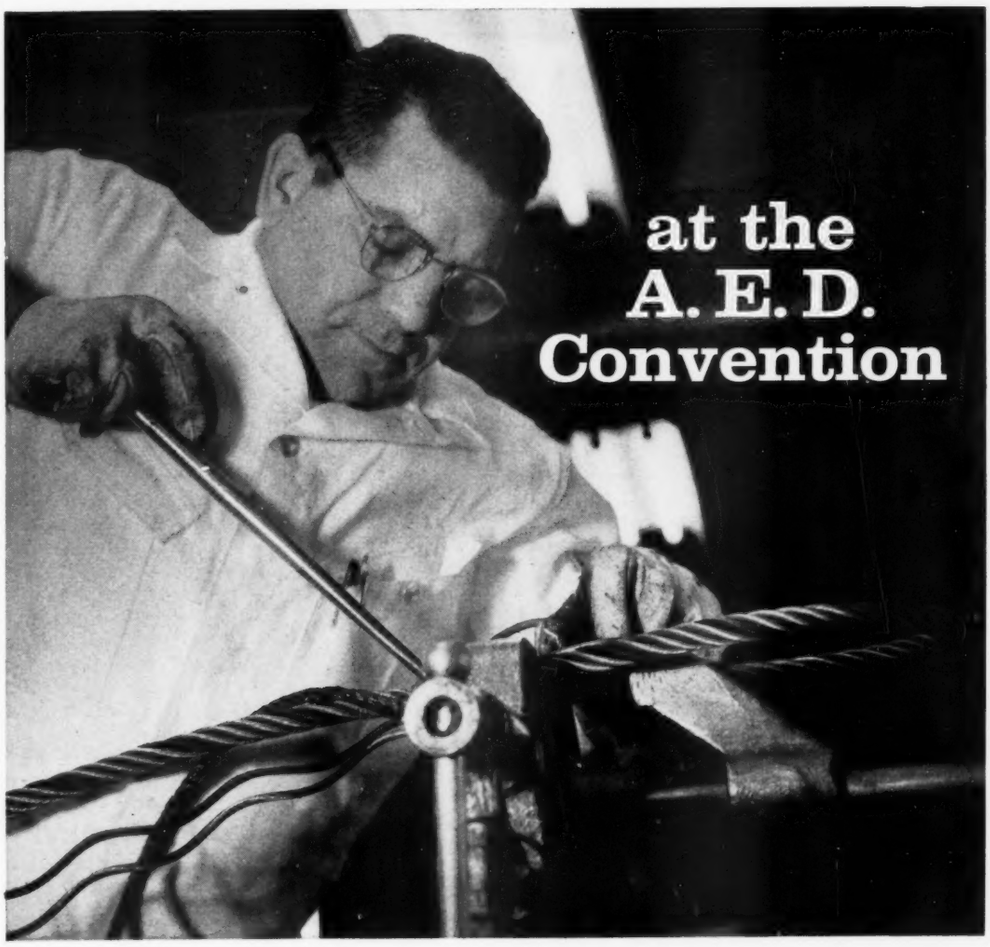
For further information write to Hydroway Scales, Inc., 20624 W. Eight Mile Road, Detroit 19, Mich., or use the Request Card at page 18. Circle No. 155.

## Concrete forming system

■ The Rocform system of concrete forming is described in an illustrated brochure from the company. The claim that the system offers an extremely fast method of forming is backed up by a series of photographs that record the progress of form erection on a typical job. The photographs also serve as a step-by-step description of how the system works. The component parts in the Rocform system are pictured and described. Also described are the company's training program for contractors and its engineering service.

To obtain this brochure write to the Rocform Corp., 15160 W. Eight Mile Road, Detroit 35, Mich., or use the Request Card at page 18. Circle No. 160.

NEAR THE PASSENGER AND FREIGHT TERMINALS of the Baltimore & Ohio Railroad in Pittsburgh, Pa., a 25-ton Lorain Moto-Crane, Model MC425, pours concrete for the downtown section of the new expressway through the city. The B & O terminals and yard tracks were razed and relocated to make room for the new highway. The John F. Casey Co., Pittsburgh, is contractor for the concrete operations. For more information on the Moto-Crane write to the **Thew Shovel Co.**, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 68.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## avoid legal pitfalls

### Negligent parking of dozers

THE PROBLEM: *Earthmoving contractors left two bulldozers on a mesa above San Diego, Calif., when work ceased on Saturday. Youthful vandals attempted to start one of them but failed because it had been securely locked by a special device, consisting of a sleeve welded to a padlock that locked around the starter rod. But the youths were able to start the other one by merely pushing a compression lever and stepping on the starter, because an ineffectual substitute was used when the lock that the dealer had furnished was lost. That foiled the vandals' project for racing the bulldozers, but they drove the one that started for 15 or 20 minutes. Unable to stop it, they headed it down-hill toward a canyon and abandoned it. It traveled a mile, injuring persons and damaging property until a wall and a utility pole broke its travel. Did the evidence warrant a finding that the contractors were liable for having negligently left the bulldozer in an insecure condition?*

THE ANSWER: Yes. (Richardson v. Ham, 285 Pac. 2d 269, decided by the California Supreme Court.)

The court said that the trial judge did not err in granting a new trial after a jury had decided in favor of the contractors.

The Supreme Court had previously decided in another case that an owner of an automobile was not liable for negligent driving by a thief who was able to drive the car away because it was not locked. But the court said that a bulldozer is to be differentiated from an automobile because it is more likely to attract meddlers. And the fact that the insecure bulldozer was left on the top of a hill created a particular hazard.

This particular bulldozer was not equipped at the factory with a lock, but the contractors had recognized the need for a lock by procuring one from the dealer. They "slipped up", at great expense to themselves or their insurance company, when the lock was lost and they failed to get another.

### Rights of the surety as assignee of proceeds

THE PROBLEM: *A school-building contractor gave payment and performance bonds and assigned to the surety the right to the contract proceeds as indemnity against liability. Did the surety's claim against the proceeds outrank a judgment against the contractor that was not connected with the school project?*

THE ANSWER: Yes. (Gombert v. George C. Fuller Contracting Co., 139 N. Y. Supp. 2d 464, decided by the New York Supreme Court, Appellate Division, Second Department.)

### Contractor not liable for death of careless worker

THE PROBLEM: *An employee of a steel-erecting subcontractor, working on building construction, used a material-elevator hoist as a means of reaching the 15th or 16th floor. When the elevator stopped, he was thrown from it and fatally injured. No emergency required that he use the hoist instead of other means of getting to the upper floor. No one had ordered him to use the elevator; he had acted on his own volition. Was the prime contractor liable?*

THE ANSWER: No. (Youngblood v. Henry C. Beck Company, 91 S. E. 2d 796, decided by the Georgia Court of Appeals.)

The court said that the worker, fully knowing the conditions involved in riding the hoist, assumed the risks incident to doing so.

### Illegal picketing of site

THE PROBLEM: *A prime contractor on an air force base was one of few contractors on the project who refused to pay overtime wages for work in excess of 40 hours weekly, but paid overtime for work above eight hours daily. Unnecessarily large numbers of pickets and cars blocked the entrance to the construction area, and there were intimidating telephone calls to the contractor's superintendent, an assault upon a foreman, and separate similar acts connected with the picketing. Did an Arkansas court properly enjoin the acts?*

THE ANSWER: Yes. (Smith v. F. & C. Engineering Co., 285 S. W. 2d 100, decided by the Arkansas Supreme Court.)

The court said that it has become well settled law "that peaceful picketing is allowed under the constitutional guaranty of freedom of speech in order that a union may acquaint


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the public with the fact and nature of a labor dispute and solicit public support in any lawful manner," but that it "is equally settled that the law does not countenance the use of threats, intimidation, force, coercion, violence, or other unlawful means, however laudable the motive or purpose of the strikers."

### Builder proves performance

THE PROBLEM: *A contractor who had orally agreed to build according to plans and specifications sued for a balance allegedly due. The owners' answer to the suit claimed that the job was defective in both labor and materials. Did this require that the contractor convince the jury that the work had been done according to the contract, rather than place on the owners the burden of proving the contrary?*

THE ANSWER: Yes. (Baerveldt & Honig Construction Co. v. Szombathy, 289 S. W. 2d 116, decided by the Missouri Supreme Court.)

The decision follows a fundamental rule of law that one cannot force payment under a contract without convincing the trial judge or jury that he has performed his part of the contract, unless the owner admits it. Nor can he force payment when, as in this case, testimony that has not been contradicted seems incredible to a jury.

### Operator is injured when boom touches wire

THE PROBLEM: *A construction-company employee sued an electric company for injury sustained when a crane boom touched an overhead uninsulated electric wire in a street where a building was being erected. The electric company caused the construction company to be made a party to the suit. The jury decided that the electric company was liable to the injured man, but that it was entitled to reimbursement by the construction company.*

*Was the construction company entitled to a new trial on the ground that the trial judge had failed to instruct the jury properly as to the conditions under which the electric company would be entitled to indemnity by the construction company, in view of the fact that both companies were negligent?*

THE ANSWER: Yes. (Banks v. Central Hudson Gas & Electric Co., 224 Fed. 2d. 631, decided by the United States Court of Appeals, Second Circuit.)

The court reviewed a decision by a judge of the United States District Court, Southern District of New York. The case involved a question of which of the two companies was principally at fault for the accident. The electric company had moved the wires from the opposite side of the street where the building was being erected. The wires were 40 feet above ground, higher than required by local regulations, but notice that the wires were not insulated had not been given. The company knew that a 40-foot crane would be used. On the other hand, the construction company had increased the accident hazard by piling metal blocks under the wires. And it was its signalman who failed to signal movement of the boom.

Particularly important is the declaration by the Court of Appeals that even if an electric company knows that a crane is to be used in proximity to its wires, there is no duty to de-energize the wires "if less drastic measures, not involving a suspension of its obligation to serve the consuming public," are available and are reasonably believed to be sufficient to protect the public from harm.

A new trial was ordered because the trial judge erred in indicating to the jury that the electric company's primary liability hinged on the one question whether it had been negligent in failing to post warnings. The jury should have been ordered to determine whether the electric company should have de-energized the wire or have insulated it.

### Negligent driving

THE PROBLEM: *A transfer company, under a contract to carry stone from a quarry to a construction site, rented a truck and driver. The quarry company paid the transfer company for the haulage, and the transfer company paid the truck owner, who paid the driver's salary and furnished the gasoline and oil used by the truck. But the transfer company had the right to control the driver. Negligent driving of the truck resulted in death*

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## Edited by A. L. H. STREET
### Attorney-at-Law

*These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.*

## avoid legal pitfalls

*of an outsider. Did liability in damages rest upon the transfer company?*

THE ANSWER: Yes. (Tindall v. Perry, 283 S. W. 2d 700, decided by the Kentucky Court of Appeals.)

The court exonerated the quarry owner, the construction contractor and the president of the transfer company who negotiated the rental of the truck and driver from the owner.

### Repair claim is denied

THE PROBLEM: *A contract to construct a state bridge over a parkway stated that the contractor should be liable for all damages to the work during progress, except "damages resulting from faulty designs as shown by the plans and specifications". Because of a steel shortage, the contractor substituted timber beams for steel beams. This necessitated a center support which obstructed the highway. When an automobile crashed into the support, the bridge had to be repaired. Was the state liable to the contractor for the cost?*

THE ANSWER: No. (Garofano Construction Co. v. State of New York, 149 N. Y. Supp. 2d 750, decided by the New York Supreme Court, Appellate Division, Third Department.)

The court said that provision of the contract for maintenance of traffic on the highway during the construction could not be regarded as a faulty design within the contract clause quoted above. The decision approved one that had been rendered previously by the New York Court of Claims.

### Bank was not liable for forged checks

THE PROBLEM: *A contractor doing a very large banking business entrusted to an accountant-office manager the preparation of checks which were placed on the contractor's desk for machine signing. In dealing with this employee, the contractor's bank reasonably believed that the contractor placed great trust in him. Over a period of several years, the employee embezzled the contractor's funds by drawing checks on and payable to the bank and by securing the proceeds. Was the bank liable for the loss, under Louisiana law?*

THE ANSWER: No. (Fidelity & Casualty Co. of New York v. United States Fidelity & Guaranty Co., 81 So. 2d 576, decided by the Louisiana Court of Appeal, Second Circuit.)

The court decided that the checks were so drawn as to be in effect payable to bearer.


For more facts on insert, circle No. 500

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### Contractor is liable for employee negligence

THE PROBLEM: *A general contractor leased to a plumbing contractor a winch truck for use in unloading pipe from a railroad car. He also furnished an operator for the truck. If the operator so negligently operated the truck as to injure one of the plumbing contractor's employees, was the general contractor or the plumbing contractor liable for the accident?*

THE ANSWER: The plumbing contractor was liable on the theory that the operator of the truck was, for the time being, his employee. (Rector v. Walden, Fulton & Payne, 276 S. W. 2d 933, decided by the Texas Court of Civil Appeals, Amarillo.)

The court reconciled the decision with decisions reached by Texas courts in two other cases. In one of those cases, the lessor, who furnished a dragline and operator, was declared to be liable for negligence of the operator, because the lessor exercised control over him while the work was being done and special skill in doing the work was required. In the other case, the borrower of a tractor with attached bulldozer was killed while directing its operation, and the operator was treated as having been his temporary employee.

### Priority right of lessee

THE PROBLEM: *The owner of land orally leased a plant site to a transit-mixed concrete company. Later the owner permitted the Army to build a hospital near the plant on the same tract of land. The Army forced the company to remove its plant because the noise of its operation disturbed the patients. Regardless of whether the oral lease was valid under Michigan law, was the company entitled to collect from the government the cost of moving the plant?*

THE ANSWER: Yes. (Ann Arbor Construction Co. v. United States, 126 Fed. Supp. 161, decided by the United States Court of Claims.)

### Subsurface drainage as part of paving

THE PROBLEM: *As against objection by abutting-property owners, did city authorities have a right to provide for subsurface drainage in connection with a street paving project?*

THE ANSWER: Yes. (Wharton v. City of Alexandria, 77 So. 2d 1, decided by Louisiana Supreme Court.)

The courts were impressed by the city engineer's explanation that elimination of open-ditch drainage would remove hazard to travelers and avoid the need for retaining walls to avert erosion of dirt beneath the pavement.

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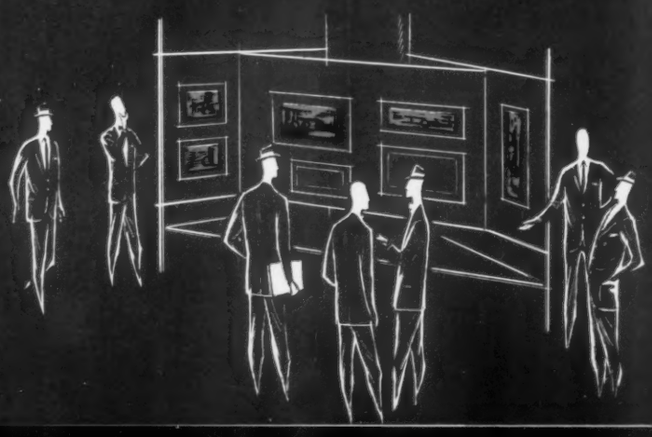

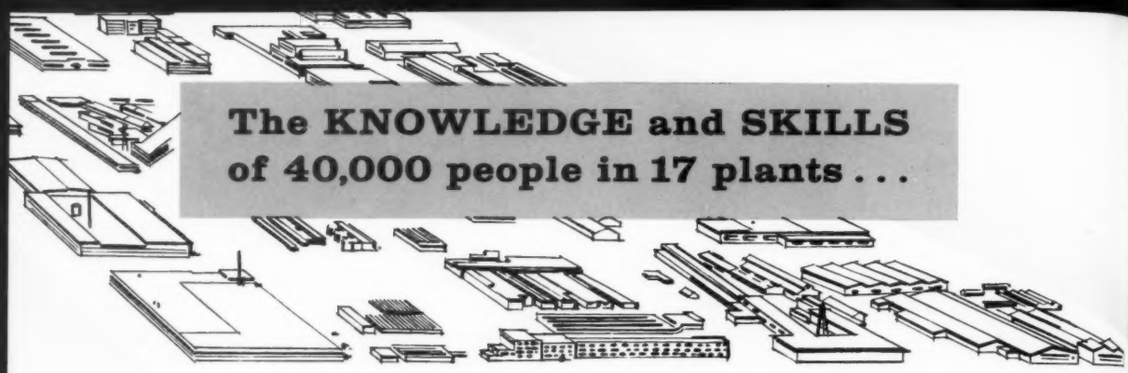

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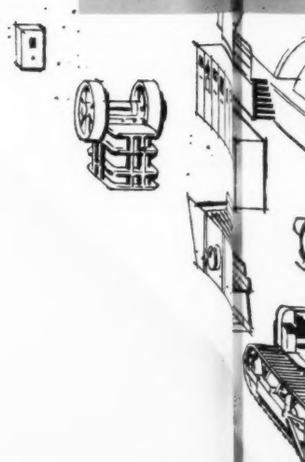

Engineering-in-Action

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**fo rod**

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XPERIENCE gained in building more than
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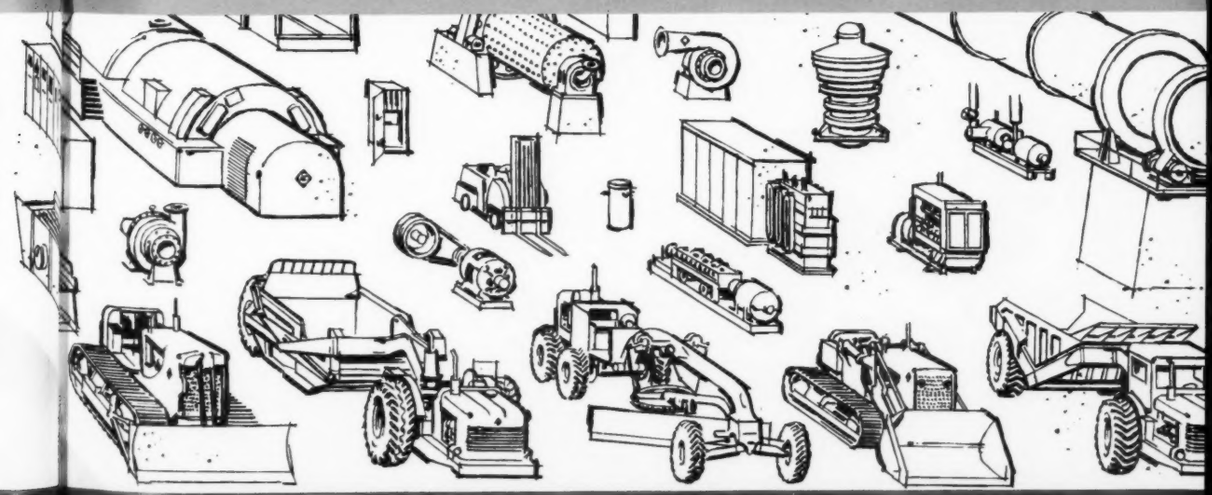
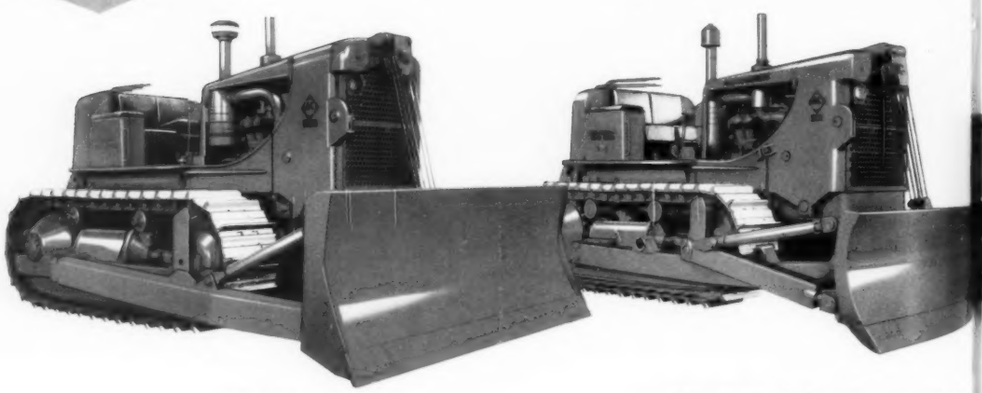


dvanced-design construction machinery . . .
roduction and profit on the job!

# Engineering-in-Action FOR



**HD-21**
204 net engine hp
(torque converter drive)
2 forward speeds to 7.5 mph
1 reverse speed to 5.5 mph
53,400 lb (approx. as shown)

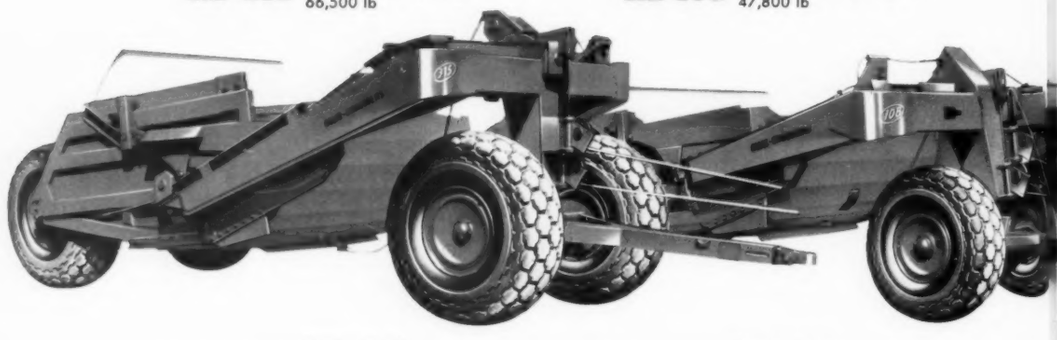
**HD-16**
150 net engine hp (torque converter drive)
3 forward speeds to 7.2 mph
2 reverse speeds to 5.5 mph
141 belt hp (standard transmission)
6 forward speeds to 5.8 mph
3 reverse speeds to 4.5 mph
38,200 lb (approx. as shown)

HD-1

**4-cu-yd HD-21G**
204 net engine hp
(torque converter drive)
13-ft, 4-in. dump height
66,500 lb

**3-cu-yd HD-16G**
150 net engine hp
(torque converter drive)
12-ft, 3-in. dump height
47,800 lb

2¼-c
HD

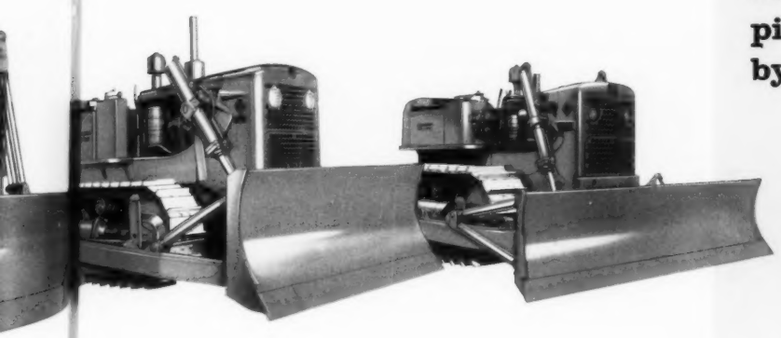


**Model 315**
Struck—15 yd
Heaped—20 yd
Cable control
25,850 lb

**Model 108**
Struck—8.4 yd
Heaped—11 yd
Cable control
15,250 lb

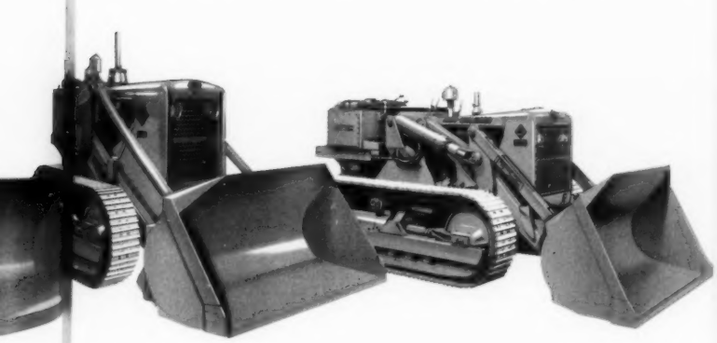
Mod

FOR UCTION AND PROFIT ON THE JOB



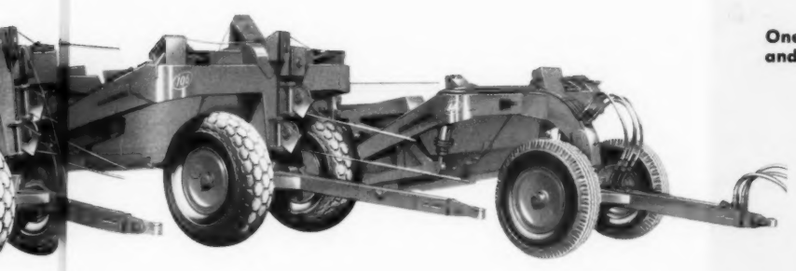
**HD-11** 94 belt hp, 6 forward speeds to 5.7 mph, 3 reverse speeds to 4.4 mph, 24,600 lb (approx. as shown)

**HD-6** 63 belt hp, 5 forward speeds to 5.5 mph, 1 reverse speed to 2.0 mph, 15,850 lb (approx. as shown)



**2¼-cu-yd HD-11G** 111 net engine hp, 11-ft, 7-in. dump height, 32,000 lb

**1½-cu-yd HD-6G** 72 net engine hp, 10-ft dump height, 19,600 lb



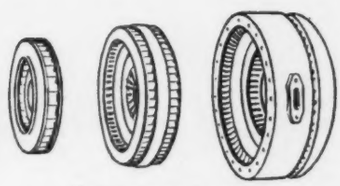
**Model 106** Struck—6.1 yd, Heaped—7.5 yd, Cable control, 10,300 lb

**Model 44** Struck—4 yd, Heaped—4.7 yd, Hydraulic control, 6,595 lb

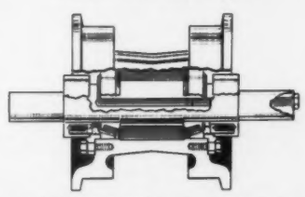
## Examples of Engineering in Action

# ADVANTAGES

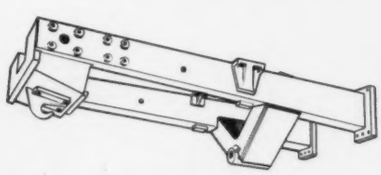
## pioneered and proved by Allis-Chalmers



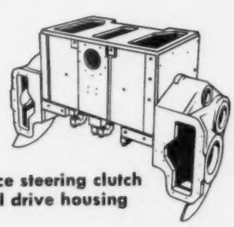
**Torque converter drive**



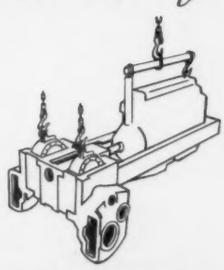
**1,000-hour lubrication intervals**



**All-steel Box-A main frame**



**One-piece steering clutch and final drive housing**



**Unit construction**

# Engineering-in-Action FOR PRODUCTION

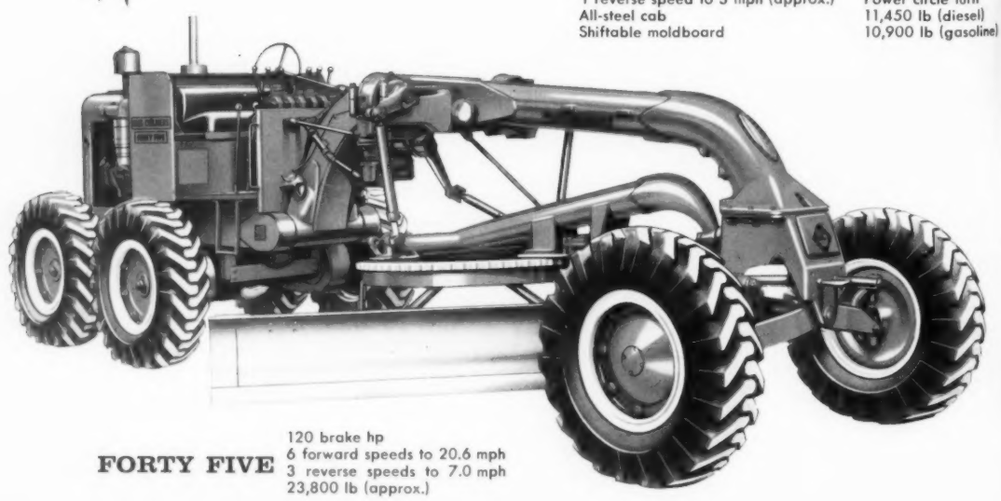
**TS-360**
280 hp
Struck—15 yd
Heaped—20 yd
Speeds—to 20.0 mph
Weight—49,050 lb
(approx.)

**TS-260**
200 hp
Struck—11 yd
Heaped—14 yd
Speeds—to 20.0 mph
Weight—39,600 lb
(approx.)

**TW-360**
Struck—17 yd
Heaped—22 yd
Tons—26
Weight—47,000 lb
(approx.)

## Model D Special

50 brake hp, gasoline or diesel engine
4 forward speeds to 25 mph (approx.)
1 reverse speed to 3 mph (approx.)
All-steel cab
Shiftable moldboard
Hydraulic scarifier
Leaning front wheels
Power circle turn
11,450 lb (diesel)
10,900 lb (gasoline)



**FORTY FIVE**
120 brake hp
6 forward speeds to 20.6 mph
3 reverse speeds to 7.0 mph
23,800 lb (approx.)

ROLL-AWAY is an Allis-Chalmers trademark.

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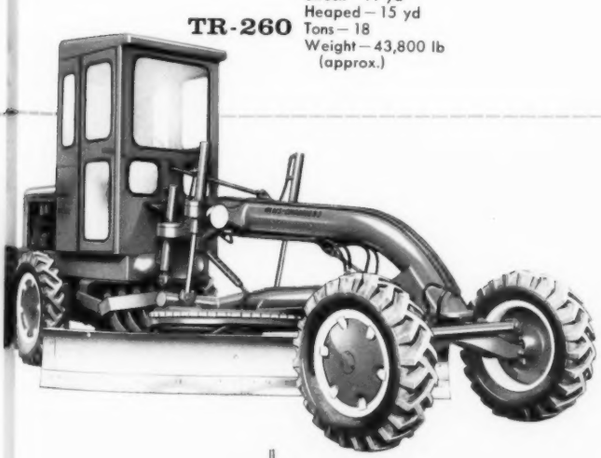
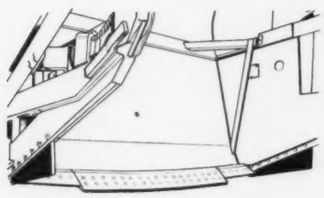
**TR-260**
Struck—11 yd
Heaped—15 yd
Tons—18
Weight—43,800 lb (approx.)

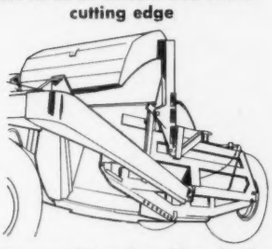


**Model D Standard and Rear-End Loader**
8,800 lb (gasoline)
9,350 lb (diesel)
⅜-cu-yd bucket—hydraulically controlled
Loader—2,200 lb (approx.)

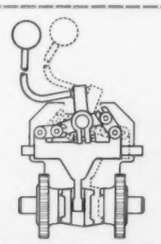
## Examples of Engineering in Action ADVANTAGES pioneered and proved by Allis-Chalmers



**Curved bowl bottom and offset cutting edge**

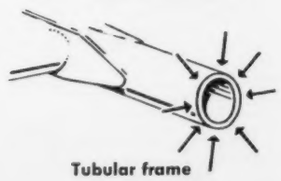


**High apron lift and positive ejection**



**Toggle-type control**

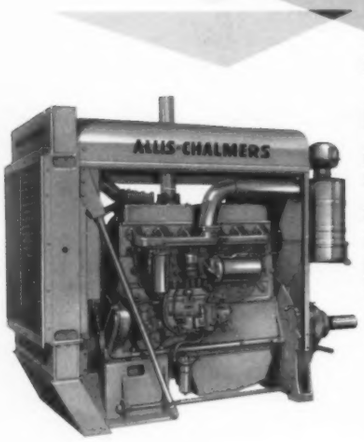
**ROLL-AWAY moldboard**



**Tubular frame**

# Engineering-in-Action

**FOR PRODUCTION AND PROFIT ON THE JOB**




## Power Units

**D-153 Diesel**
35 max. brake hp @ 1800 rpm

**D-230 Diesel**
53 max. brake hp @ 1800 rpm

**B-125 Gasoline**
28 max. brake hp @ 1800 rpm

**D-779 Diesel**
160 max. brake hp @ 1800 rpm

**D-844 Diesel**
189 max. brake hp @ 1800 rpm

**DS-844 Diesel**
243 max. brake hp @ 1800 rpm

**W-226 Gasoline**
60 max. brake hp @ 1800 rpm

## Wheel Tractors

**Model IB**
22.87 belt hp

**Model WD-45**
45 belt hp

## TRUE ORIGINAL PARTS AND SERVICE

Your Allis-Chalmers construction machinery dealer offers you the benefits of factory-trained, well-qualified men to provide fast, expert service on your equipment and keep it working at designed capacity. He stocks only *True Original Parts*, engineered right, manufactured right, to perform right . . . help you take full advantage of the big road-building years ahead.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION, MILWAUKEE 1, WISCONSIN

**ALLIS-CHALMERS**

FORM NO. MS-1196—3612

Printed in U.S.A.

The Demag B-504 crawler-mounted hydraulic excavator uses a ½-cubic-yard bucket. It can also be operated as a backhoe and as a clamshell.

"Turning in your bid with a case of whiskey was a good idea, but we like our bids in duplicate."

## Crawler-mounted excavator digs to depth of 11½ feet

■ When used as a backhoe, the new crawler-mounted hydraulic excavator being marketed by Kurt Orban Co., Inc., can dig to a depth of 11½ feet. It can be used with a shovel-bucket or a clamshell, as well as with a backhoe. The B-504, an import, is manufactured by Demag - Baggerfabrik Gmbh, Germany.

As a shovel, the Demag uses a ½-cubic-yard bucket and has a digging height of 21 feet and a dumping height of 14¾ feet. It can dig up to 56 inches below ground level. The backhoe also has a ½-cubic-yard capacity. Its digging height is 11¾ feet. It can dump up to a height of 10⅓ feet.

With a clamshell, the Demag B-504 can cut to a depth of 8½ feet. Its maximum height with the bucket closed is 9¾ feet; with the bucket open it is 13 feet. The rig's maximum digging force at the dipper teeth is 14,500 pounds.

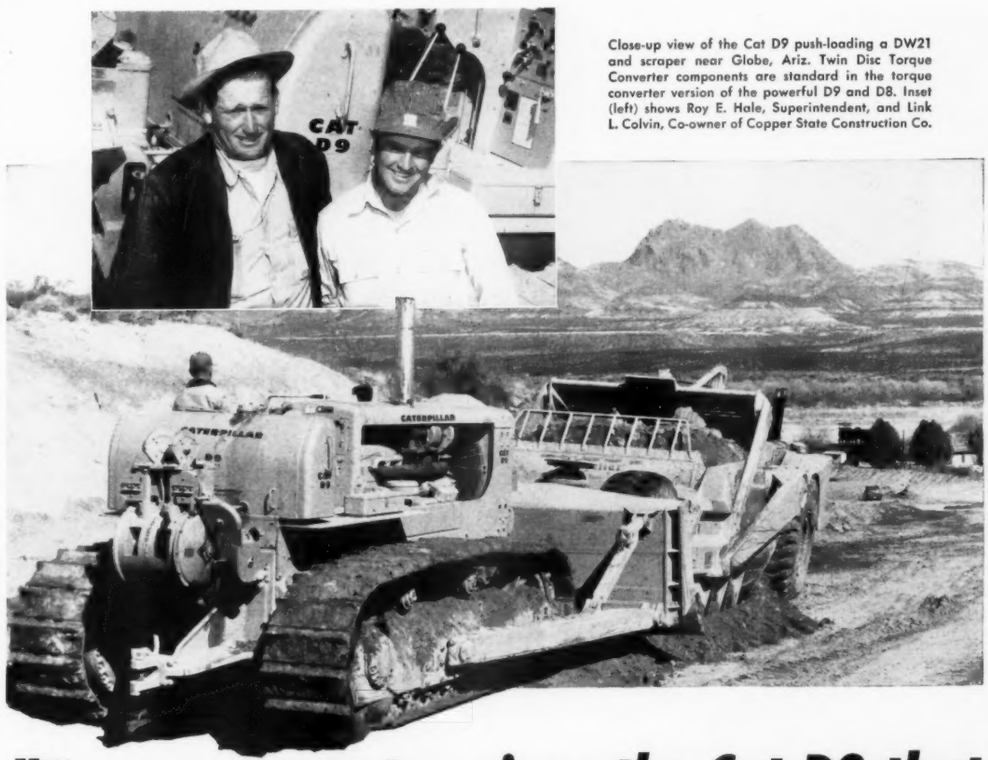
The hydraulic excavator uses a 3-cycle 4-stroke Deutz diesel engine that develops 42 horsepower at 1,500 rpm. Its digging speed is rated at 149 cubic feet per minute and has a traveling speed of 2.6 mph.

For further information write to Kurt Orban Co., Inc., 22 W. Putnam Ave., Greenwich, Conn., or use the Request Card at page 18. Circle No. 191.

## Portable crushing plant

■ A portable dual crushing plant, available in four sizes, is described in a brochure from Lippmann Engineering Works, Inc. Complete details and specifications concerning the Comanche plant are included. The four sizes have been designated as the Cub, Scout, Warrior, and Chief. The Warrior and Chief both have hydraulically lowered screens. Brief descriptions of other Lippmann equipment for pit and quarry operations are also included.

To obtain this brochure write to Lippmann Engineering Works, Inc., 4603 W. Mitchell St., Milwaukee 14, Wis., or use the Request Card that is bound in at page 18 of this issue. Circle No. 19.


Close-up view of the Cat D9 push-loading a DW21 and scraper near Globe, Ariz. Twin Disc Torque Converter components are standard in the torque converter version of the powerful D9 and D8. Inset (left) shows Roy E. Hale, Superintendent, and Link L. Colvin, Co-owner of Copper State Construction Co.

# "Torque converter gives the Cat D9 that extra 'boost' when you need it"

***Roy E. Hale, Superintendent, Copper State Construction Co.***

When Copper State Construction Co., Mesa, Ariz., took on the contract for building a clover-leaf on U. S. Highway 70 about 20 miles east of Globe, Ariz., it had to move some 70,000 cubic yards of earth—fast and profitably. So one of the powerful Cat D9's (equipped with Twin Disc Torque Converter components) was put on the job, push-loading Cat DW21's and scrapers.

Sizing up the D9's operations, Copper State's Superintendent Roy E. Hale commented: "This D9 is the machine we've been looking for. We like the torque converter drive. It makes the machine operate smoothly and will give it a lot longer life. And when we need that extra 'boost' for tough material, the torque converter gives it to us—with full engine power!"

Little wonder contractors are specifying so many Cat D9 and D8 Tractors with torque converter drive. The torque converter permits the engine to operate at all times in its most efficient speed range . . . it automatically matches output torque to load demands . . . and its fluid connection absorbs those jolts and shocks that cause excessive wear and parts breakage.

Contractors everywhere agree that crawler tractors equipped with torque converter drives mean just this: less maintenance, more production—and greater-than-ever profits! Specify a hydraulic torque converter drive in your next D8 or D9 crawler tractor . . . and don't overlook the advantages of Twin Disc Torque Converter drives in other types of industrial equipment or repowering jobs.

TWIN DISC
Torque Converters

**TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division) Rockford, Illinois**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 501

# Runway for new Halifax field is graded in rock, clay, swamp

◀ Rock b
runway a
ton trucks
rock is cle
by a Cat

Grading a site that is either rough and rocky and covered by a thick growth of trees, or else has enough muskeg to swallow up the machines trying to fill in the swamp, made the job of constructing the new airport at Halifax, Nova Scotia, one of the most difficult of its kind this year.

The new field has long been needed—both because fog conditions at the present airport have caused numerous flight cancellations, and because of the increased volume of air traffic passing through Halifax. At present, both commercial and military aircraft are using HMCS Shearwater, Canada's largest Naval Air Station on the northern shores of the Eastern Passage, across the harbor from Halifax. But these flights are overloading the facilities of the base and complicating security.

The site for the new field, located in a better weather area than the old one, is at Kelly Lake, 15 miles from the city. This site—the second that had been proposed for the new field—is located deep in a wooded area, and the job of carving a road through the wilderness to the city will wait until next year.

The big job of constructing the runways—one of which will be 6,200 feet long and the other, 8,000 feet long—requires almost two million yards of material to be moved. Each runway will be 200 feet wide, will have a 200-foot swath graded on either side, and 500 feet graded at each end. Another 300 feet will be cleared and grubbed back from the graded area, with a rise of 1 foot in 50.

Diamond Construction 1955, Ltd., Fredericton, New Brunswick, holder of the $3,300,000 contract that includes all construction but the buildings at the field, began clearing in preparation for the big earthmoving job early in December, 1955. Snow usually blankets this area for almost one-third of the year, and when work started on this project, a total of 142 inches was recorded in the Halifax area. Working in deep snow, the contractor found progress slow as trees were felled, cut up, stacked by hand, and burned.

As soon as the snow melted off, stumping and clearing was started by several Caterpillar D7 and D6 tractors, two Allis-Chalmers HD-11's, and an HD-9 and International TD-14-A. Bucyrus-Erie 15-B and 22-B cranes helped pile the stumps.

### Rock, clay, and swamp

By the end of August, one shift, working 5½ days a week, had completed the clearing job and a second shift was added, bringing the earthmoving force to about 215 men. More than 50 earthmovers arrived at the site also, to work in the three types of soil in this area.

The southern half of the 6,200-foot-long north-south runway site consisted largely of rock, as did the western end of the 8,000-foot-long east-west runway area. Between these two areas was swamp land, while the remainder to be moved consisted of heavy clay.

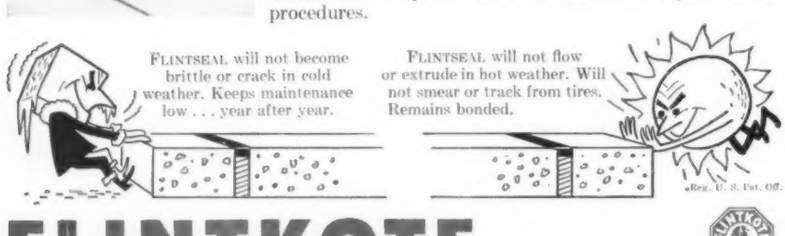

THIS IS THE FIRST PROJECT IN THE UNITED STATES
ON WHICH PAVING CONTRACT WAS AWARDED UNDER THE PROVISIONS OF THE NEW
FEDERAL HIGHWAY ACT OF 1956
MISSOURI STATE HIGHWAY COMMISSION
THE KOSS CONSTRUCTION COMPANY, DES MOINES, IOWA
CONTRACTOR

...and will use 47,000 pounds of FLINTSEAL

FLINTSEAL*. . . hot-poured rubber asphalt joint sealing compound for concrete pavements . . . gives lasting protection from leakage and *positive* sealing . . . during expansion and contraction cycles of pavement slabs. Meets Fed. Spec. SS-S-164.

Project I-89(7) & I-139(14) Laclede County, Mo., Awarded Aug. 2, 1956. FLINTSEAL supplied by Carter-Waters Corp., Kansas City, Mo.

Write for complete technical data and specification procedures.


FLINTSEAL will not become brittle or crack in cold weather. Keeps maintenance low . . . year after year.
FLINTSEAL will not flow or extrude in hot weather. Will not smear or track from tires. Remains bonded.
*Reg. U. S. Pat. Off.

FLINTKOTE

THE FLINTKOTE COMPANY, Industrial Products Division, 30 Rockefeller Plaza, New York 20, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 502

◀ Rock blasted from one of the two runway areas is loaded into Mack 10-ton trucks to be hauled to the fill. Loose rock is cleaned up around the shovels by a Cat D6.

***Almost two million yards of material handled in short season; biggest cut—700,000 cubic yards—has 500,000 yards of rock***

At the western end of what will become the 8,000-foot east-west runway, a Cat D8 levels heavy clay. A big job in itself was clearing 30-foot-tall softwoods 200 feet on each side and 500 feet at each end of the runways.

The biggest cut was in the rock in the southern portion of the new field. Some 500,000 cubic yards of rock—much of it slate—was contained in this 700,000-cubic-yard cut. Since this slate lay vertically, the contractor drilled holes two feet below grade in a close pattern of 6-foot centers. Some of the deepest holes went down 18 feet. Each pound of explosive used yielded about a yard of rock and did away with the need for secondary blasting. Shattered rock was loaded into trucks and wagons by two 2½-yard shovels, together with a 1½-yard rig and a 2-yard shovel. Cleanup around the shovels was handled by a Cat D6. Hauls were long—up to 6,000 feet—for the two Cat DW10's with side-dump wagons, two DW10's with bottom-dump wagons, a DW15 with a C & D Movall, six Euclid 15-ton trucks, three Mack 10-ton trucks, and a Dodge 10-ton truck.

At the western end of the 8,000-foot-long runway area, clay was picked up by five LeTourneau B's, pushed by Cat D9 and D8 tractors. On the shorter hauls, D8's were used to pull the 18-yard scrapers. A DW21 joined the rest of the equipment in the clay area late in the summer.

While scrapers, shovels, and trucks were working the rock and clay areas, a battery of crawler tractors and motor graders shaped and compacted the fill for the runways. The two Caterpillar No. 12 motor graders that shaped the runways were followed by two D8's pulling 50-ton straight wheel rubber-tire compactors. Two water wagons helped in the compaction.

Runways were cut 3 feet below grade in the clay and topped with 2 feet of base stone, consisting of 6-inch-maximum rock, 9 inches of crushed stone, which had a 2-inch maximum, and 3½ inches of asphalt. The runway was cut only a foot below grade in the rock cuts so that the base stone layer could be omitted. The subgrade was compacted to 95 per cent Proctor, the base to 98 per cent, and the crushed stone to 100 per cent.

All this grinding work, packed into a short working season, will enable paving to get started and will permit Diamond Construction to finish its job by November 1, 1957. By that time, two million yards of material will have been cut and filled; 600,000 tons of crushed rock compacted into the base course; 60,000 tons of asphalt spread; 24,000 cubic yards of concrete poured; 10,000 feet of 4-inch transite pipe for wiring laid; and 30,000 feet of 8 to 48-inch drainage tile laid.

THE END

For more facts, circle No. 503→

# Euclid Scrapers and Crawlers are your best investment

**Overhung engine type Scrapers of 7, 12 and 18 yds. struck capacity**

Powered by engines of 143, 218 and 300 h.p., these scrapers are the fastest selling line in the industry. Advanced design of Euclid's hydraulic lever action, bowl and cutting blade provides fast, easy loading. The 18 yd. model has Torqmatic Drive . . . all have NoSpin differential and Euclid planetary drive axle . . . unequalled accessibility of power train and major components.

**TC-12 Twin Crawler**

A completely new concept in tractor design and performance, this Euclid tractor has two 194 h.p. engines (388 h.p. total) with a separate Torqmatic Drive for each track. Changing from one speed range to another (top speed of 8.3 mph) or to one of the three reverse speeds can be done under full power. Available drawbar pull is equal to or greater than gross weight. Planetary drives can be serviced without removing track, frame or drive sprocket.

**Four-wheel Tractor Scrapers**

These 12 and 15.5 yd. scrapers have maximum stability for high speed hauls and rough roads. At 3:1 slope heaped capacity is 14 and 18 yds. A 200 or 218 h.p. engine with 5-speed transmission powers the 12 yd. scraper . . . drive tires are 21.00 x 25 standard with 24.00 x 25 optional. The 15.5 yd. scraper has 300 h.p. engine with 10-speed transmission or Torqmatic Drive . . . standard tires are 24.00 x 25 with 29.5 x 25 optional . . . a 17 yd. bottom-dump trailer is interchangeable with this scraper.

**Twin-Power "Euc" Scraper**

The Model TS-18 is powered by two engines with a total of 436 or 518 h.p. It is a one-man earthmoving crew. . . self-loads and works under conditions that stop other scrapers. Tractor has a 218 h.p. or 300 h.p. engine with Torqmatic Drive . . . scraper wheels are driven through Torqmatic Drive by a 218 h.p. engine. Tires are 27.00 x 33 with 33.5 x 33 optional. Heaped capacity at 3:1 is 21 yds.

***Your Euclid Dealer will be glad to provide information on the complete line of "Euc" Rear-Dumps, Bottom-Dumps, Scrapers, and Crawler Tractors***

**EUCLID DIVISION, GENERAL MOTORS CORPORATION, Cleveland 17, Ohio**

**Euclid Equipment**

FOR MOVING EARTH, ROCK, COAL AND ORE

GM MORE POWER FOR YOU

Northeast Equipment all-weather cabs are built to custom-fit a variety of tractors, including any combination of front and rear-mounted attachments on the tractors.

## All-weather cabs built to custom-fit tractors

■ All-weather cabs built to custom-fit a variety of tractors are announced by Northeast Equipment, Inc. The cabs feature safety-glass windshields and skylights and heavy vinyl windows, giving good visibility in all directions.

The units can be installed on Ford, Fordson diesel, Ferguson, and Oliver tractors, as well as on Sherman forklifts, Terratracs, and John Deere rigs. They are designed to fit the tractors themselves, and any combination of front and rear-mounted attachments with which the tractors are equipped.

All operating controls for the tractors and attachments are enclosed by the cabs. The cabs are available in kit form and are quickly and easily installed, the manufacturer reports.

For further information write to Northeast Equipment, Inc., Brookfield St., Worcester, Mass., or use the Request Card at page 18. Circle No. 159.

## Sidecrane-backfiller

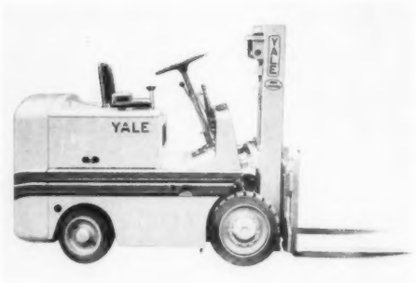
■ The Cleveland 80W, a three-way machine that backfills, acts as a tamper, and does the work of a sidecrane, is the subject of a booklet from The Cleveland Trencher Co. The bulletin shows in detail how the 80W can be employed in a wide range of construction operations. In addition to 28 on-the-job photographs, there are three case history reports. Complete specifications and dimensions of the rig are also included.

To obtain Bulletin L-102 write to The Cleveland Trencher Co., 20100 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 164.

*Visit The Cleveland Trencher Co. at the Road Show in the International Amphitheatre, Booth 417.*

## Flexible Steel appoints

Jim McComb will cover the state of California for Flexible Steel Lacing Co., Chicago, Ill., manufacturer of Flexco belt fasteners for joining conveyor and transmission belts. This state was formerly handled by Newt Crum, now vice president and sales manager of the Holz Rubber Co., Inc., Lodi, Calif.




The new Yale & Towne fork-lift truck incorporates five features that make it especially resistant to mechanical or electrical breakdown because of abrasive dusts and lint.

## New fork-lift protected against abrasive dusts

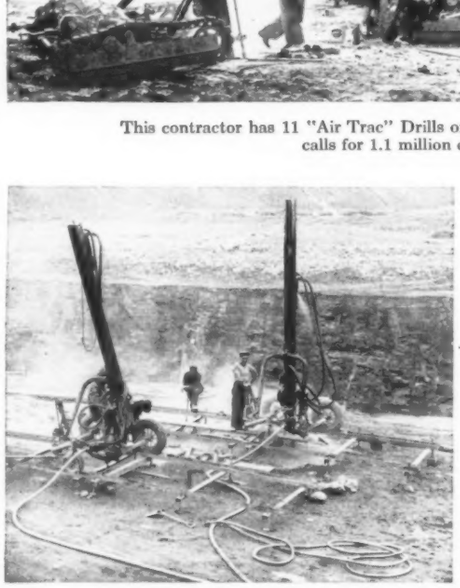
■ Five features on the new fork-lift truck announced by the Yale & Towne Mfg. Co. materially reduce the effects of abrasive dusts and lint on mechanical and electrical parts, the company reports. The truck is gasoline powered.

A dry-type and oil-bath air-filtering tandem screens air that is used by the engine. A heavy-duty oil filter


# Rock work report on the

## On the first 32 miles, 69.1% of the heavy-duty rock drills are GARDNER-DENVER

This contractor has 11 "Air Trac" Drills on the Beauharnois canal and lock project. Contract calls for 1.1 million cubic yards of rock removal.



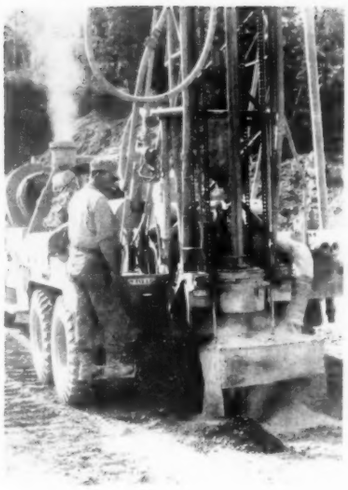
Line drilling with Gardner-Denver Wagon Drills for excavating 7600 lineal feet of seaway channel between Jacques Cartier and Victoria bridges.

Rotary 600 . . . one of the 16 Gardner-Denver Portables on this stretch of the seaway. In use are Rotary 600's, Rotary 900's and piston-type portables.

is said to prevent dust and impurities from entering the engine oil. The crankcase breather pipe also has a heavy-duty filter to purify the air it draws.

Foreign particles from floor or road surfaces are prevented from entering the engine and other working parts from beneath the fork-lift by means of an underside deflector plate. The plate can be removed for truck servicing. Preservation of the commutator surfaces and extension of brush life and contact service are made possible by means of a fully-enclosed generator and regulator.

For further information write to the Yale & Towne Mfg. Co., 11,000 Roosevelt Blvd., Philadelphia 15, Pa., or use the Request Card at page 18. Circle No. 192.



A special long drill bar and mast enables the Davey Model M-8AL rotary drill to cut 24-foot ledges without changing steels.

## Rotary drill cuts 24 feet without changing steels

■ A new rotary drill that can cut 24-foot ledges without changing steels is announced by the Davey Compressor Co. The Model M-8AL is equipped with a special long drill bar and mast. It is recommended for shot and blast holes, structure testing, and core drilling.

Suitable for mounting on any standard truck, the unit uses both compressed air and high-pressure water for drilling. It has a rated capacity of 6¼-inch holes up to 600 feet with air and 1,500 feet with water. In operation, it is said to effect substantial savings on drilling costs.

The compressor for the drill is a Davey 500-cfm unit. The water pump is a heavy-duty duplex type. The compressor and pump are driven by a GMC-471 engine mounted on the truck bed. A five-speed transmission permits operation of the drill at its most efficient speed.

For further information write to the Rotary Drill Division of the Davey Compressor Co., N. Water St., Kent, Ohio, or use the Request Card at page 18. Circle No. 170.

## Steel buildings

■ A bulletin from Armco Drainage & Metal Products, Inc., illustrates and describes four types of Armco steel buildings including specifications. Clear span widths range from 5 feet 4 inches to 100 feet, with many intermediate widths. Condensed data on the Steelox (steel-paneled) construction with an exploded view showing how the buildings are assembled is included. Steelox panels, 16 inches wide, lock together to form load-bearing walls, smooth on the outside with no protruding fasteners.

To obtain Bulletin SX-12656 write to Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 129.

*Visit Armco Drainage & Metal Products, Inc., at the Road Show in the International Amphitheatre, Booth 107 (Materials and Supply Section).*

## Tooth replacement charts

■ A booklet of tables showing the proper H & L replacement points for use on all popular makes of shovels, hoes, draglines, tractor-type hoes, rippers, clamshells, scarifiers, loaders, trenching machines, and earth augers is available from the H & L Tooth Co. Also included are charts showing the dimensions of the various points. The H & L line features the positive locking Flex-Pin connection for quick changing that requires only a hammer and oval punch.

To obtain this booklet write to the H & L Tooth Co., 1540 S. Greenwood Ave., Montebello, Calif., or use the Request Card at page 18. Circle No. 21.

*See the H & L Tooth Co. at the Condex Show in the Conrad Hilton Hotel, Booth 203.*


# St. Lawrence Seaway

▲Approximate locations for contracts using a total of 47 Gardner-Denver rock drills.

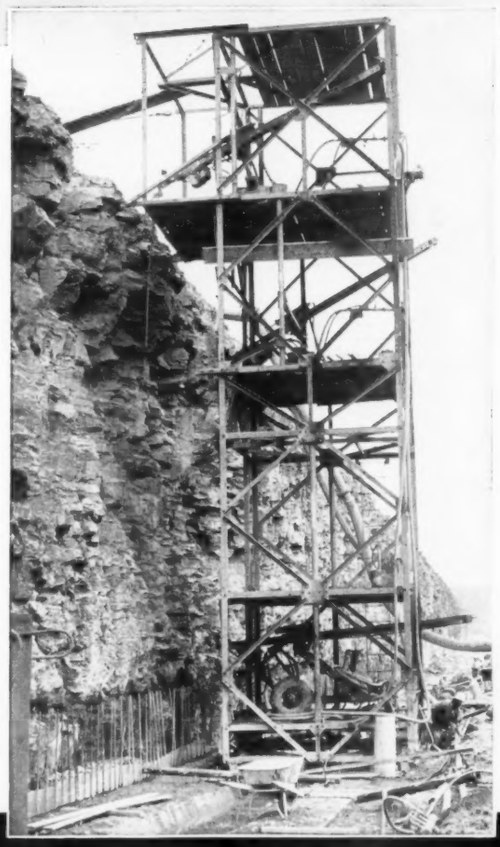
That's on the Lachine and Soulanges sections—where most of the heavy rock excavation is going on.

Here, ten contractors are using a total of 68 heavy-duty rock drills. 47 of these drills—or 69.1%—are Gardner-Denver. At work are:

**25** Gardner-Denver "Air Trac"® Drills
**18** Gardner-Denver Wagon Drills
**4** Gardner-Denver Jumbo Drills

All these drills are equipped with Gardner-Denver steel—mostly with 600 Series ring seal shanks, sectional rods, couplings and bit adapters.

**On the same stretch of seaway . . . 16** of the 24 portable air compressors are Gardner-Denver.



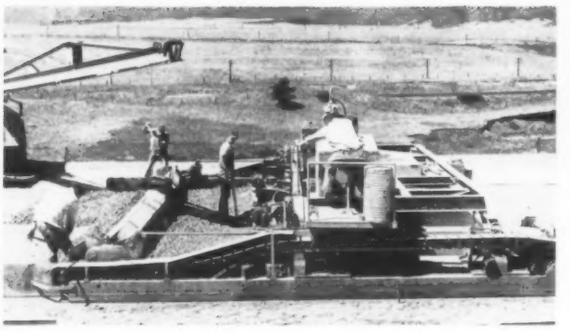
40-foot-high scaffold mounts three Gardner-Denver DH99J Drills on 10-foot RMC Feeds. Drilling 3-inch anchor bolt holes, 30 feet deep, for reinforcing rods.

**GARDNER-DENVER**

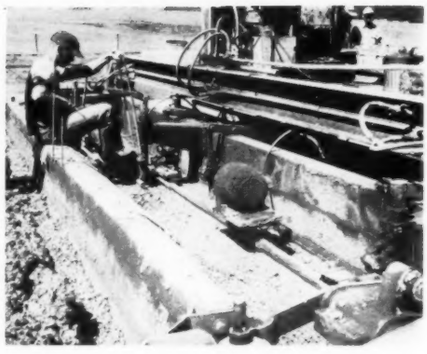
THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

Gardner-Denver Company, Quincy, Illinois
In Canada: Gardner-Denver Company (Canada), Ltd., 14 Curity Avenue, Toronto 16, Ontario

For more facts, use Reader-Reply Card opposite page 18 and circle No. 504



The hydraulically controlled strike-off bar of the Quad City rig is pushed about 6 feet ahead to level the concrete. Two Kansas City, Mo., firms, Bushman Construction Co. and Harrison Engineering & Construction Corp., are using the rig on its first large-scale finished paving job.



The strike-off meters concrete to the tamping bar of the paver. The workman at center is placing ⅝-inch steel dowels in the fresh concrete for the longitudinal joints.

# Slip-form paver does complete mechanized job

No conventional side forms were used in the paving of a 24-foot-wide and 8-inch-thick portland cement concrete highway in Colorado.

Eliminating the need for side forms —and for the usual form gang—was a piece of new equipment—a slip form machine made by Quad City Equipment Co., Rock Island, Ill. Though a demonstration of the paver was held in Colorado late last fall, this 12-mile job between Castle Rock and Monument marked the first use of the machine on a large-scale finished paving job.

The paver worked exceptionally well on the road, completing a virtually mechanized paving job as it moved along. The machine takes concrete from the paver, evens it out, strikes it off, tamps the surface with a reciprocating screed bar, vibrates the concrete internally, and puts a belt finish on the surface.

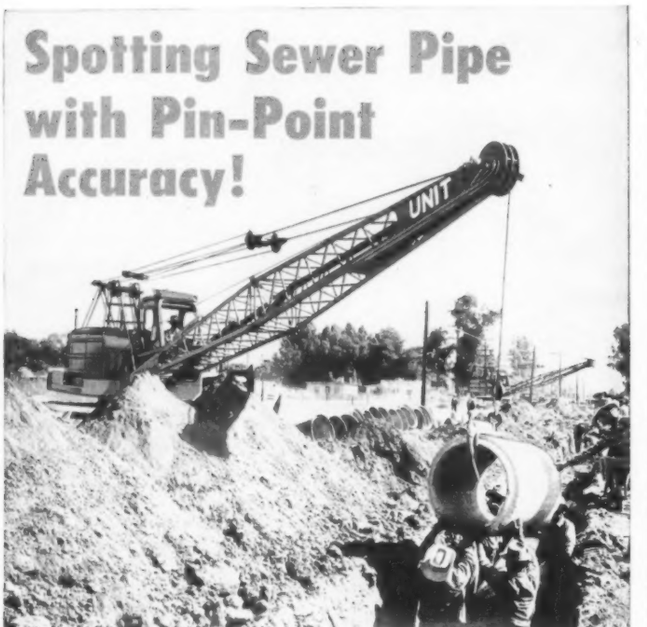
Project officials reported no trouble with the machine on superelevated curves, sharp curves, or steep grades. The average paving production was 1,600 linear feet of slab in 9 hours. But the paver also beat that figure. Visual inspections by experienced personnel indicate that the slab will meet specification requirements of ⅛-inch deviation in 10 feet.

### Crawler mounted

The paver is a crawler-mounted machine, with individual electric motor drives on each track. This independence of each track makes for positive and precise steering. On either side of the machine are the trailing slip forms, which can be made shorter or longer, depending on the requirements of the job. On this very first job, they were 8 inches high and 60 feet long, and they left clean, vertical well-defined side faces that were free from blemishes.

A strikeoff blade, similar to a bulldozer blade, is mounted on the front of the paver. Hydraulic pistons at each side permit the operators to strike off the concrete surface for a distance of about six feet ahead of the rig. Internal-type vibrators consolidate the concrete and the reciprocating screed bar tamps down about two inches into the mix.

This action, all done with the aid of


**UNIT provides ample power maneuvers easily**

Here is the ideal crane for placing pipe exactly where you want it...and placing it FAST. This sturdy, dependable machine provides easy maneuverability, plus precision-steadiness. The safety-promoting FULL VISION CAB gives the operator an unobstructed view of the entire operation, at all times. Makes pipe-positioning more efficient, safer, more profitable to all concerned. On other jobs, too, UNIT is equally satisfactory. It will pay you to investigate.

UNIT Models are available in ½ or ¾ yard Excavators... Cranes up to 20 tons capacity... Crawler or Mobile type... Gasoline or Diesel. All models convertible to all attachments.

UNIT CRANE & SHOVEL CORP.
6309 W. Burnham St. • Milwaukee 14, Wis., U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 505

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WHO EVER SUNK THAT OLD PILING SURE KNEW HIS BUSINESS!
YEP, THEY PROB'LY NEVER FIGURED THEY'D BE YANKED UP AGAIN. GOOD THING WE GOT THAT VULCAN EXTRACTOR OR THEY'D STILL BE THERE!
THIS 1200-A VULCAN PILE EXTRACTOR PULLS HEAVIEST, LONGEST, MOST DIFFICULT PILING STEEL. CONCRETE OR WOOD...MAKES NO DIFFERENCE
BEST OF ALL THERE'S ONLY ONE MOVING PART...AND IT CAN'T GET OUT OF ORDER
Bulletin 71-C describes the Extractor, includes specifications, a list of duplicate parts and on-the-job photos. Send for your Free copy to:
VULCAN IRON WORKS INC.
327 NORTH BELL AVENUE
CHICAGO 12, ILLINOIS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 506

***Road forms, form setting gang, big equipment train are eliminated on 12-mile divided highway project***

The Koehring 34-E Twinbatch paver dumps concrete ahead of the Quad City slip-form paver. The dump is carefully controlled so that the low-slump concrete is distributed evenly across the grade, permitting the rig to do its best work.

totally enclosed electric motors, reduces the concrete from a harsh, dry mix with a slump of about 1½ to 1¾-inches to a creamy-textured slab. The only finishing necessary is some longitudinal floating with long-handled tools. The paver even drags its own burlap finish from one of the steel trusses that tie the trailing slip-forms together.

**Job moves rapidly**

The paving of the 12-mile sections of U. S. 85–87 was done by Bushman Construction Co., and Harrison Engineering & Construction Corp., both of Kansas City, Mo. The work consisted of ripping up the top 12 inches of subgrade that had been built under another contract, recompacting the material, applying 8 inches of compacted subbase material, paving the roadway, and finishing off the project by dressing 10-foot outboard shoulders and 4-foot inboard shoulders. Paving was done on the northbound lane of the divided highway first, while traffic was carried by the southbound lane. Paving equipment and traffic then switched to opposite lanes for the remainder of the job.

The preparation work on grade and base was subbed to C. L. Hubner Co., Denver, a firm specializing in highway and airfield work. Hubner moved in with a Caterpillar D8 and a McCoy scarifier to rip up the old roadbed. This had dried considerably, and it was necessary to add water to bring the moisture content to its optimum of about 10 per cent. Several passes of the scarifier, before and during the application of water, were necessary before the moisture was distributed through the material. Compaction of the subgrade was done by a Blaw-Knox pneumatic vibrating compactor.

The subbase cushion material, a coarse sand and fine gravel available at three locations adjacent to the project, was dug by a Lima dragline at the start of the project, and officials planned to use a Kolman loader to supplement the dragline. The material, hauled to the highway, was watered and road-mixed with motor grader blades as it was laid out. The subbase was then compacted by the Blaw-Knox vibrating compactor, which left the fill slightly high.

Final dressing of the subbase was done by setting a row of survey bluetops to accurate line on one side and grades on both sides of the slab. A Quad City planer, towed by a Cat D7, then trimmed the subbase to final grade. A light Buffalo-Springfield

(*Concluded on next page*)


# Gulf products and fine service
## keep equipment rolling
## at seven million dollar shopping center

A quarter of a million cubic yards of earth will be moved in constructing the new Essex Green Shopping Plaza in West Orange, N. J. This seven million dollar shopping plaza, built on the site of an old golf course, will have 500,000 square feet of store area and parking space for 3500 cars.

Gulf products are used exclusively on this project by Lugano Brothers, Inc., of Belleville, N. J. In fact, Lugano Brothers have used nothing but Gulf products for 12 years . . . because they know they can always depend on Gulf for quality products, helpful petroleum engineering counsel and prompt delivery.

Fourteen hundred Gulf warehouses are at your service, too. Find out exactly how they can serve you. Write for your copy of "Gulf and *Your* Business."

Oil is checked by Mr. Al Lugano, at right, and Mr. Edward Striffler, Gulf Sales Representative. This bulldozer has been operating on Gulfpride H. D. Select for more than 8700 trouble-free hours.

**GULF OIL CORPORATION**
**GULF REFINING COMPANY**
1822 Gulf Building
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GULF

**THE FINEST PETROLEUM PRODUCTS FOR ALL YOUR NEEDS**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 507

steel roller made a pass over the bladed surface. Since no form trenches had to be cut, the string line, set at line and grade, remained in place while pointers on both the planer and slip-form paver worked to the reference line.

#### Concrete paving

The contractor used one batching setup at two locations along the job so that 3-mile hauls could be made, from each setup, in either direction. The plant consisted of a Johnson batch plant for rock aggregates, a Butler bulk cement silo, and another Johnson batcher for weighing sand. In getting loaded, batch trucks drove through the plant setup, receiving aggregate, cement, and sand in that order. A Manitowoc kept the rock bins charged, a second crane kept the sand hoppers full.

The batch trucks dumped to the skip of a Koehring Twinbatch paver, which operated on the 10-foot shoulder area. Mixing water was taken through a connecting hose by the paver pump and delivered to the mix—a 6-sack-per-cubic-yard proportion. After enough moisture had been added to make a 1½-inch slump concrete, the material passed through the paver drums and was dumped to the grade. The paver operator used a little more care than usual in placing the concrete ahead of the spreader, because an even dump in front of the paver—which has no screws to distribute the concrete—enabled the rig to work at peak efficiency.

As the slip form moved along, a man riding on the front of the machine inserted the transverse dowel bars in the concrete at 18-inch intervals. Later, a longitudinal joint was cut over these bars. Two cement finishers with floats, and one man who made edge repairs where necessary followed the paver.

Three ConSawMatic concrete saws were used to cut the 25-foot transverse joints. The control transverse joints were cut as soon as the concrete attained initial set. The interval transverse joints were brought up the next day, when longitudinal joints were also cut. Sawing was done within 16 to 24 hours. Some uncontrolled cracking was reported on some parts of the job. Permite white-pigmented curing compound was used to seal the slab.

The new slip form paver is reported to be able to pave at 8 feet per minute as it moves ahead. At this rate, it would take all the concrete that two pavers could turn out to keep the new machine working. On this first job, the machine was operated between 2 and 3 feet per minute.

W. J. Rolfe is vice president of Bushman Construction Co., which handled the job from its Denver branch office. Field supervision was under superintendent W. K. Logan and resident department engineer H. G. Phelps. Mark U. Watrous heads the Colorado State Highway Department, and Fred O. Stearns is construction engineer. George N. Miles is engineer for the district in which the project was completed.

THE END

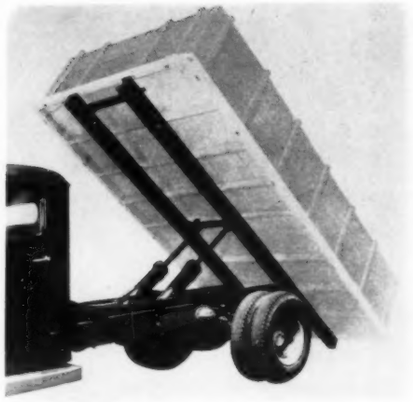
## Two-cylinder truck hoist dumps at 40-degree angle

■ A 2-cylinder truck body hoist with a 26-inch piston stroke is announced by the Perfection Steel Body Co. The piston stroke gives a dumping angle of 40 degrees.

The hoist and the lifting mechanism are set in a structural steel subframe which is mounted and transferred from one chassis to another, according to the company. The setup is recommended for use with 12 to 16-foot bodies having payloads of from 8 to 12 tons.

The twin cylinders have diameters of 5½ inches. The cylinders, hydraulic pump, and power takeoff are incorporated into the hoist.

For further information write to the Perfection Steel Body Co., Galion, Ohio, or use the Request Card that is bound in at page 18 of this issue. Circle No. 185.



A piston stroke of 26 inches gives the Perfection 2-cylinder truck body hoist a dumping angle of 40 degrees.


Longer tandem life

One of 9 reasons why contractors find International Trucks cost least to own!

In any off-highway truck operation, you need a tandem and other major components built to stand up and take it, to keep costs way down.

And cost records prove* that over the years International Trucks cost *least* to own!

The reason is simply this: It is International policy to build trucks that do the job better, do it longer at lower cost than any other make—International spends more to build the truck so it costs you *least* to own.

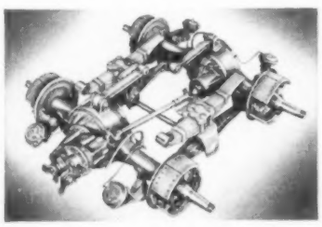
That's why there are more owners of Internationals than any other 6-wheel truck, and have been for the past 21 years!

The way to trim your trucking costs is to get together with your International Dealer, today. He's right at the other end of your phone.

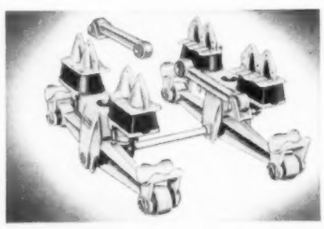
*Signed statements in our files, from fleet operators throughout the U.S., back up this statement.

INTERNATIONAL HARVESTER COMPANY, CHICAGO

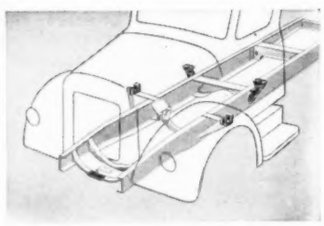
Motor Trucks • Crawler Tractors
Construction Equipment • McCormick® Farm Equipment and Farmall® Tractors



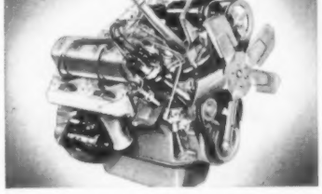
1 **All International tandems** give longer, more dependable life. This unit has rubber bushings at all 10 oscillating points to reduce maintenance and lengthen life. Third differential with lock transmits power smoothly and evenly to each axle.



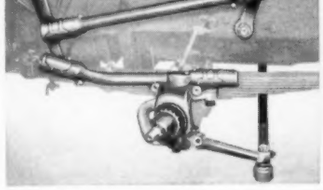
2 **Lightweight suspension** with rubber load cushions provide soft, easy riding, empty and loaded. Cushions reduce truck weight and servicing. Optional aluminum walking beams, spring saddles and wheels increase payloads more than 500 pounds.



3 **For cab comfort and long life.** Quiet, level ride without transmitting stress to cab, fenders, hood or radiator is the result of wide spaced, rear shackle type mountings in an exclusive International 5-point rubber-insulated V-8 cab suspension.



4 **Most powerful, most economical V-8's** under any truck hood—206, 226 and 257 hp. for faster acceleration and higher average road speeds with less shifting. More miles per gallon of gasoline. Other gasoline, LPG and diesel engines up to 356 hp.



5 **True geometric steering** provides easier handling, outstanding maneuverability with short turning circles. Gears are cam and roller mounted twin lever type. Controls mounted *ahead* of the front axle. Steering wheel is comfortably positioned.

6 **Steel-Flex frames** combine great strength with flexibility. Heavy-duty construction plus reinforced cross-members with husky gussets provide for proper tandem suspension. Inverted L-type reinforcements give full load-length support.

"Fellow stockholders, we find we make more selling our scale models as toys, than we do on their full-size counterparts!"

The Chicago Pneumatic G-800 Tracdril is self-propelled and one-man-operated. Its two 6-hp tramming motors provide enough power to tow a CP 900-cfm rotary compressor up a 10 per cent grade.

## Self-powered wagon drill tows its own compressor

■ A self-propelled, one-man-operated, track-mounted wagon drill that tows its own air compressor around the drilling area is available from the Chicago Pneumatic Tool Co. The CP G-800 Tracdril has a pair of Power Vane reversible tramming motors, one to power each track independently. According to the manufacturer, the two 6-hp motors provide enough power to tow a 13,000-pound CP 900-cfm rotary compressor up a 10 per cent grade.

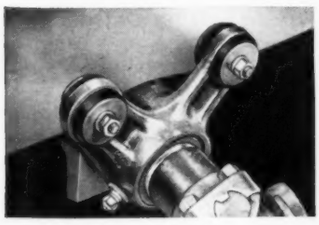
Since the tramming motors are never used while the drill is operating, a 365-cfm compressor provides sufficient air. When the rig has moved into the drilling area, the compressor is uncoupled, allowing the G-800 to move from hole to hole, within the limits of the air line.

The Tracdril has a special "knee-action" construction to compensate for ground irregularities. The tracks operate independently within the "knee-action" limits and keep the U-arm support for the drill carriage relatively level, the manufacturer reports. The U-arm is raised or lowered hydraulically and employs dual safety locks to hold its setting.

The drill carriage itself may be adjusted for high top-hole or toe-hole drilling. This compensates further for ground irregularities. The drill carriage may also be positioned either crosswise ahead of or between the track threads when running snake holes.

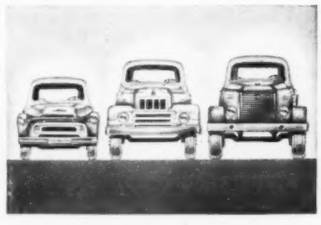
For further information write to the Chicago Pneumatic Tool Co., 6 E. 44th St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 187.

International builds six-wheel models from 22,000 lbs. GVW to 76,800 lbs. GCW in conventional and COE design. There is one practically custom built for your job. Engines range in sizes up to 1091 cu. in.—famous sixes and three great new V-8's. Complete selection of all-wheel-drive models also available to make the toughest going easy. You name the job, International has exactly the right truck for it—the truck that costs you *least* to own.



**7 New "silent spin" center bearings** have quiet, tapered roller bearings. Prelubricated, sealed and shielded for long, trouble-free operation. Self-aligning, wide spaced rubber mountings dampen noise and vibration, eliminate service.

**8 All-wheel-drive** models have the extra traction and pull needed for all tough, off-highway operations. Completely factory-built, 7,000 to 33,000 lbs. GVW. Low height with ample ground clearance. Complete selection of equipment available.



**9 World's most complete line.** There is an International "tailor-made" for every truck job, ½ tonners to 90,000 pounders. Choice of 4-wheel, 6-wheel and all-wheel-drive models, conventional and COE design. Every one built to cost *least* to own.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 508


## Marion Shovel and Osgood bought by Universal Corp.

The assets of the Marion Power Shovel Co. and the Osgood Co., both of Marion, Ohio, have been acquired by the Universal Corp., Washington, D. C. Both companies will operate as divisions of Universal, without any change in operations. At a meeting of the Universal board of directors, Milton T. Smith was elected president and general manager of both divisions.

The 1½ to 2-inch cut is made by a Felker saw using a Bay State Krete-Kut 14-inch reinforced-resinoid abrasive blade.

The ⅜-inch-thick blade of the Vibro-Joint machine is vibrated 5 inches into the slab so that the larger pieces of aggregate are moved downward and to the side—out of the line of the joint to be sawed.

# Abrasive blades save on cost of sawing joints in runway

Deciding to saw expansion joints rather than using formed joints in the 25-foot lanes of the new Kelly Field runway in San Antonio, Texas, H. B. Zachry Co., San Antonio, was able to pave the runway in a continuous ribbon, producing a smooth-riding slab. Prior to the actual sawing operation, and while the concrete was still wet, the contractor vibrated a ⅜-inch-thick blade about 5 inches into the fresh concrete. Some 10 to 11 hours later, he sawed the joints along the same line.

The important job of joint sawing started at 5 or 6 p.m. each day, after paving crews, working from 7 a.m., had placed up to 3,600 yards of concrete in a 25-foot-wide and 18 or 20-inch thick lane. About 90 per cent of the slab for the runway was 18-inch-thick plain concrete; the remainder was 20-inches thick.

Following the paving crews was a Vibro-Joint machine, which rolled on wheels straddling the slab as it vibrated a ⅜-inch-thick blade 5 inches into the concrete. This displaced the aggregate down and to the side of the cut, forming a guide—free from hard aggregates—that the concrete saw could use later on. This technique of preparing the way for sawing has been shown to more than double blade life in tests on air strips.

Sawing generally continued through 4 a.m. of the following day, or until the sawing crew had cut joints in all the concrete laid during the day shift.

Zachry used reinforced-resinoid blades in a Felker saw to make the 1½ to 2-inch-deep cuts in the slab in one pass. The Bay State Krete-Kut blades used have a resin bond and are reinforced against breakage. The combination of the Vibro-Joint machine, used before joints were sawed, and the blades using silicon carbide rather than the more expensive diamond grit, enabled Zachry to save a considerable amount of money on the entire sawing operation. THE END

## Drake-Williams-Mount personnel news

Hugh W. Williams is filling the newly created post of sales representative and promotion manager of the Drake-Williams-Mount Co., Omaha, Nebr. Mr. Williams is the son of Arthur W. Williams, president of the firm.


HERE'S THE EXCLUSIVE

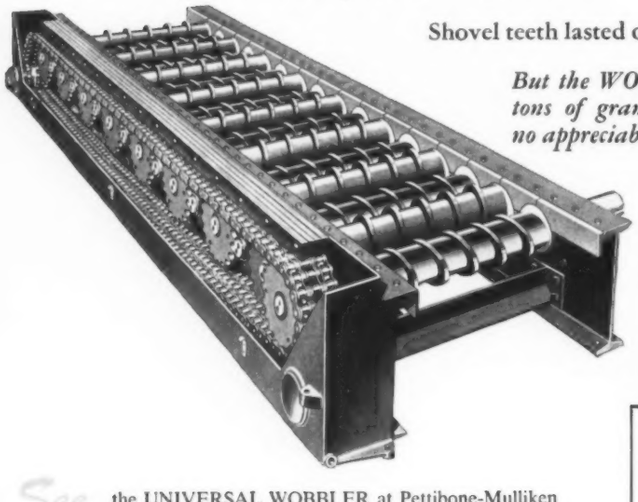
PETTIBONE UNIVERSAL WOBBLER

*the most advanced idea in existence for separating fines from oversize!*

Leading construction publications are currently reporting the WOBBLER as a "contract saver" on the Montgomery Dam project, Alma, Colorado.

Shovel teeth lasted only two 10-hour shifts—

*But the WOBBLER handled 325,000 tons of granite in four months with no appreciable wear—no breakdowns!*



ROAD SHOW FEATURE
Jan. 28 — Feb. 2

MAKE THE UNIVERSAL WOBBLER *a "must see" item at the Road Show and learn how you can use it to increase your primary crusher capacity from* 50 to 100%

Write for literature showing complete range of Wobbler Feeder sizes.

See the UNIVERSAL WOBBLER at Pettibone-Mulliken Booth No. 813 in Donovan Hall, International Amphitheatre, Chicago.

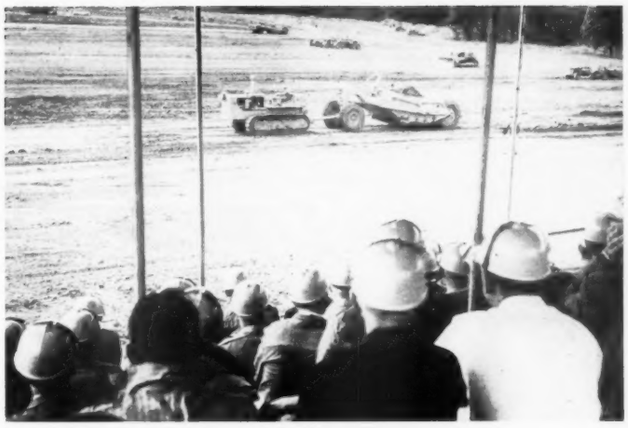
See the NEWEST PRODUCT COMBINATION FOR HANDLING AGGREGATES EVER AVAILABLE TO THE ROAD BUILDER AND CONTRACTOR — The UNIVERSAL WOBBLER, combined with a UNIVERSAL IMPACT MASTER.

*The Wobbler, in this combination is now at work for Grannas Bros., Altoona, Pennsylvania.*

PETTIBONE UNIVERSAL In Cedar Rapids Since 1906

UNIVERSAL ENGINEERING CORPORATION
620 C Avenue, N.W., Cedar Rapids, Iowa
Subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois

For more facts, use Reader-Reply Card opposite page 18 and circle No. 509



FORTY SOIL CONSERVATION ENGINEERS observe earthmoving techniques during the two-day school held for them by the Caterpillar Tractor Co., Peoria, Ill. Conducted at the request of the Soil Conservation Service, the school familiarized the engineers with the major aspects of dirt-moving. Caterpillar representatives conducted the classes in earthmoving costs, production, and equipment selection, and also provided the group with an opportunity to operate Caterpillar equipment.

### Heavy track roller frames available for excavator

■ To provide an extra-sturdy undercarriage for the Cat No. 977 Traxcavator, heavy-duty track roller frames are now available as an attachment from the Caterpillar Tractor Co. According to the company, use of the new attachment lengthens the life and lowers the maintenance costs on the track components.

For better stability, the new frames increase the length of the track on the ground to 8 feet 10 inches. Because of their additional weight, they lower the rig's center of gravity. In addition, the frames increase ground clearance by 2⅜ inches.

A special low-speed transmission is made part of the attachment to match the adverse terrain over which the rig may operate. The lower speeds afforded by the special transmission enable the No. 977 to work more efficiently with higher tractive effort, the manufacturer reports.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 131.

*Visit the Caterpillar Tractor Co. at the Road Show in the International Amphitheatre, Booths 701, 720.*

### Figurework manual

■ A manual describing the various applications of Remington Rand's Model 99 printing calculator is offered by the company as an aid to builders and contractors responsible for the figurework in their organizations. Entitled "Methods and Procedures for Efficient Figurework", the manual contains case histories outlining a number of builders' and contractors' experiences in using the calculator. Among the subjects covered in the individual brochures which make up the manual are: Checking incoming invoices; preparing estimates; computing labor costs; computing payrolls; and compiling payroll data for compensation insurance. Specific applications described include computing concrete costs when preparing estimates.

To obtain Manual C1053 #6 write to the Remington Rand Division, Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 22.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*Because CLIPPER Sells* QUALITY!

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*Now Here's a SAW That Has POWER PLUS — Watch It Go!*

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**36 H. P.** *Self-Propelled*

Powerful 36 H.P. Engine gives you all the power you need for full depth cutting in the hardest aggregates at speeds up to 26 feet per minute!

*Turn on a Dime with Exclusive "Retract-A-Turn"*

No Tilting—No Lifting. Raise the blade out of the cut . . . Retract - A - Turn" casters automatically take over the load. Both rear wheels are raised clear of the pavement and the Clipper rolls easily in ANY direction.

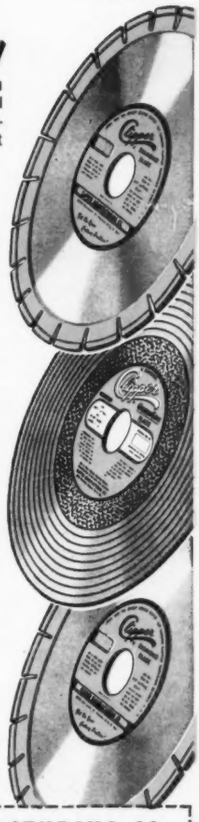
**POSITIVE SCREW FEED**

A "Must" when using low-cost "Green-Con" Abrasive blades to compensate for diminishing blade diameters. Protects valuable diamond blades from bumping and scraping. A positive control at all times.

MODEL **C-360**

36 H. P. with Self-Propelling Unit. Speeds up to 26 feet per minute. One of several powerful Clipper Concrete Saws for any concrete sawing job.

*Ask for* **FREE** DEMONSTRATION **TRIAL** *on Your* Job!



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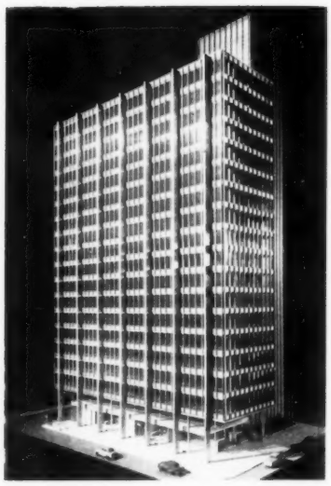
For more facts, use coupon or Reader-Reply Card opposite page 18 and circle No. 510

# Only exterior columns support floors of 19-story building



This model of the new inland Steel building in Chicago shows the arc-welded exterior columns which will support all floor and roof girders and eliminate the need for interior columns.

Fourteen massive exterior columns, about 287 feet long from footing to main roof, will support the 19 stories of the Inland Steel Co. headquarters now being built in Chicago and provide each floor with a total of 10,000 square feet of office space free of interior columns.

The row of seven columns at the front of the building and the row of seven columns at the rear support each of the 57×175-foot floors, taking the entire load of the building except for the windowless service tower that stands to the rear of the structure and contains elevators, stairways, and other service facilities.

"Torque boxes", located at column joints and the middle of column sections, tie columns to the building's structural steel, help resist torsional forces, and resist deflections.

### Column fabrication

The row of columns at the front of the building and the row at the rear are equally spaced 25 feet 10 inches apart. Each pair supports, at each floor and at the roof, a girder about 60 feet long, including the stub extensions welded to the columns. Each girder in turn supports all the floor and roof beams.

The huge columns are being fabricated by an automatic arc-welding process at the Chicago plant of Joseph T. Ryerson & Son and shipped to the work site. The sections, for the most part 26 feet long, are made by joining five heavy plates by fillet welds so that, in effect, a combination of two I-beams is produced. The dimensions of the plates, and their thicknesses, are such that no standard I-beams could be rolled on an economic basis and no riveting could be done within the over-all dimensions specified. These dimensions, however, allow the columns to be encased in a concrete box that will have a covering of stainless steel on three sides.

Plates forming the column webs are beveled at all edges so that a deep penetration of the weld metal is insured. The large weld fillets require three or more passes, but they give the columns enough strength and

←For more facts, circle No. 511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BROWNHOIST bridge and crane BUCKETS

we have the type and size to best handle the job, dependent on material and equipment

Open-type grab buckets and link-type buckets for bridge cranes, fast-plant unloaders and large gantry cranes are available in capacities from 35 to 400 cubic feet.

Because of their simplicity of design and rugged construction, Brownhoist buckets (such as the link-type left or the open type grab bucket above) withstand extremely severe abuse. Abrasion-resistant alloy steel nose plates protect against coarse materials.

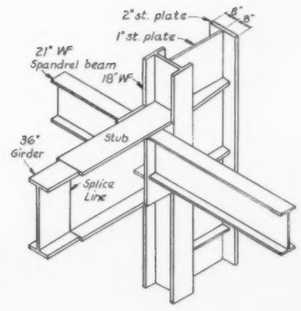
Brownhoist clamshell buckets (right) in capacities from ½ cu. yd. to 3 cu. yds. are used with cranes for handling coal, ore, sludge, slag, rock or wet clay. They're engineered (as a result of over 80 years experience) to take full bites, year after year with trouble-free operation. Write today for catalog.

INDUSTRIAL BROWNHOIST CORPORATION
BAY CITY, MICHIGAN

185-A

For more facts, use Reader-Reply Card opposite page 18 and circle No. 512

Column sections near completion in the Joseph T. Ryerson & Son plant in Chicago. The ends of the sections will be milled square so that joints will make a finished bearing against an adjacent section.




A sketch of a typical "torque box" that connects floor girders and spandrel beams to exterior columns.

stiffness for the load they are to bear.

A Peck universal ram-type welding fixture, being used to fabricate the column sections, increases the speed of the welding operation and, at the same time, insures welds of highest quality and maximum penetration. This machine is equipped with a Lincoln Twinarc head, controls, and generators, permitting fabrication to be done on an economical basis. The head feeds two wires simultaneously, rather than a single wire, substantially increasing the speed of the welding operation. Hand arc welding is used to make the girder stiffener joints before the sections leave the factory.

As the huge columns, with their unusual sections and heavy plates are completed, both ends are milled off square to bring the section column to length. Each end makes a finished bearing against the mating end of the next section in a column.

**Torque boxes welded**

At each joint in the column, and at the middle of each section, a "torque box" is being welded in place to form a sturdy set of connections tying the column to other major structural elements and providing a high degree of resistance to deflections in all planes.

The boxes, also arc-welded in the Ryerson plant, serve several purposes. Those at the joints are welded to the inner edges of the columns and hold a pair of column sections in line. Similar welds are made to hold the box to the center of the section, where its plates are continuous.

In each box is a stub beam with the inner end welded to the column and the other end mated with the end of a floor girder. Attached to the sides of the stub beam are brackets to which sprandrel beams are joined. The boxes also have stiffener plates that form box-like structures capable of resisting torsional forces like those that arise from wind loading.

The "torque boxes" are also welded to column sections at the Ryerson plant, but some welding is required in the field. Where bevels are needed for welding, they are made in the shop.

*(Concluded on next page)*

For more facts, circle No. 514→

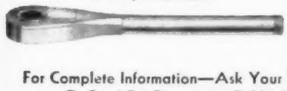

## LOWELL REVERSIBLE WRENCHES WORK FAST

Wrench efficiency is measured by speed and dependability. Time studies prove that reversible ratchet wrenches cut costs by their fast action. Always ready for quality performance are Lowell wrenches. Their high tensile handles, heat-treated steel pawls, and all-steel cogs insure greater strength and safety.

**SERIES 50 SOCKET WRENCHES**
Formerly Steel Socket Bridge and Red Socket Wrenches

**SERIES 40 GEAR WRENCHES**
Formerly "Red Face" Bridge Builders' Wrenches

**SERIES 20 WRENCHES**
Formerly 1916 Pattern



**Series 50—Socket type wrench**
The socket allows the bolt to pass through, and is reversible by flipping the "trigger" near the socket. Handles from 8" to 60"; square or hex sockets up to 9 1/16".

**Series 40—Gear type wrench**
The flat gear, hole-thru type, is made for heavy duty. It is reversed by a "trigger" near the gear. Handles from 24" to 48"; square or hex gears from 3/4" to 4 3/8".

**Series 20—Gear type wrench**
Especially popular with machine tool builders, it has the reversing knob at the *end* of the handle. Modern appearance, and heavy duty. Handles from 7" to 36"; square or hex gears from 1/4" to 2 3/8".

For Complete Information—Ask Your Distributor
Or Send For Descriptive Folder L-12

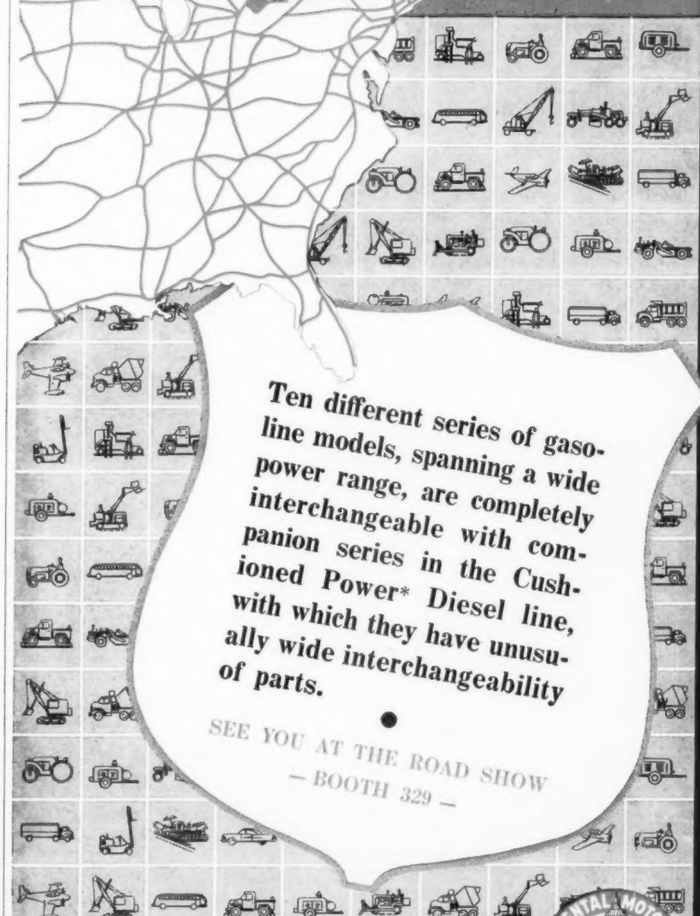
**LOWELL WRENCH CO.**
WORCESTER 8, MASS.

LOWELL RED RATCHET WRENCHES

L-12


For more facts, use Reader-Reply Card opposite page 18 and circle No. 513


# MORE Power... BETTER Power... for Every Phase of the BIG ROAD PROGRAM!



Ten different series of gasoline models, spanning a wide power range, are completely interchangeable with companion series in the Cushioned Power* Diesel line, with which they have unusually wide interchangeability of parts.

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(Continued from preceding page)

Here too, clips that hold the field assembly temporarily are also applied. The joints that have to be welded in the field are so located that the welding job is easily done.

#### Field welding

The chief welding operation in the field is that needed to join the ends of roof and floor girders to the mating stub ends already incorporated in the "torque boxes". The ends of the top and bottom flange plates of the girders and stubs, beveled on their upper faces in the Ryerson shop, have grooves that are readily filled in downhand welding during the erection work. Vertical welds are also made to join the girder web plates after the temporary bolting clips have been removed. These welds, which make the girder continuous from column to column, are subject primarily to shearing stresses, as are all other welds made during erection.

The new Inland Steel headquarters building was designed by the architectural and engineering firm of Skidmore, Owings & Merrill, Chicago, designer of the controversial Lever House in New York. At least as unusual as the Lever building, the Inland Steel structure is admittedly not the most economical type of steel construction. The cost for extra steel, estimated to be 5,000 tons for the complete frame, is believed to be outweighed, however, by the fact that all the floor space in the building will be free of columns. THE END

## Portable asphalt plant

■ A bulletin describing the TM Mobile Mixer, a portable asphalt plant that is completely self-contained on a single trailer frame, is available from the Standard Steel Corp. Designed for on-the-job mixing in rural areas, the plant can be erected in 30 minutes, the manufacturer states. Shown in photographs and discussed in the text are essential parts of the plant, such as the "self-lift" erecting device that raises the entire mixing and gradation unit. Specifications for the portable plant, and a listing of the accessories that are available for it, are also included.

To obtain this bulletin write to the Standard Steel Corp., Road Machinery Division, 5007 S. Boyle Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 163.

*Visit the Standard Steel Corp. at the Road Show in the International Amphitheatre, Booth 235.*

## Low-bed trailers

■ Its line of low-bed trailers is described in a folder from the Rogers Bros. Corp. Included are single, tandem, and triple-axle units with and without detachable goosenecks. Various special trailers are also listed and pictured, as are tilt-deck models.

To obtain this folder write to the Rogers Bros. Corp., 108 Orchard St., Albion, Pa., or use the Request Card at page 18. Circle No. 84.

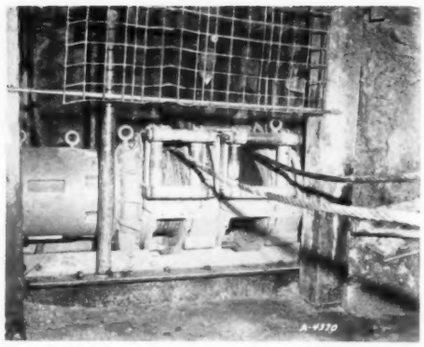
## New frame hoist handles 5-ton single-line pulls

■ A heavy-duty scraper hoist that will handle single line pulls up to 10,000 pounds is announced by the Ingersoll-Rand Co. The "41" frame hoist has a pull rope speed of either 250 or 300 fpm, depending upon the model.

The new hoist incorporates the I-R "Unit Assembly" design. Each unit is made up of its own barrel-type housing, rope drum, gearing, and clutch—independent of the next unit. The double and triple-drum units can be arranged for overwinding or underwinding of rope.

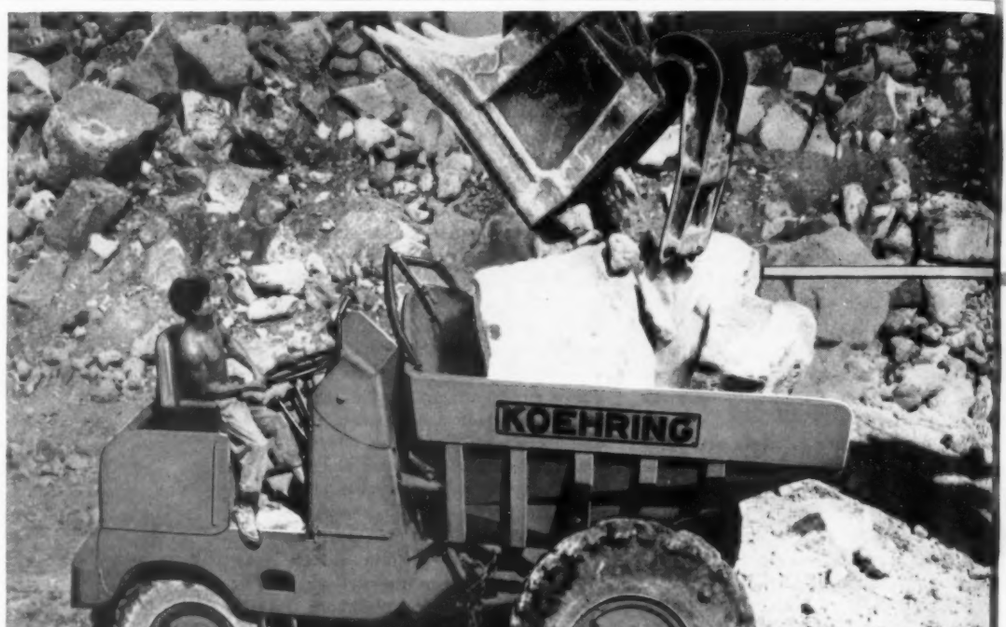
Depending upon the model, a 50, 60, or 75-hp motor is used. Optional equipment includes air-operated clutches; high-slip, high-torque motors; and air-electric remote controls.

For further information write to the Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y., or use the Request Card at page 18. Circle No. 130.



A double-drum model of the new "41" frame scraper hoist, incorporating I-R's "Unit Assembly" design.

*Visit the Ingersoll-Rand Co. at the Road Show in the International Amphitheatre, Booth 712.*




*Shovel-loading big-chunk rock into Dumptor — square body opening provides 64 square feet of target for easy loading over the side, or either end. It's the heavy-duty hauling unit with a ton of strength for every ton of payload capacity!*

*Plenty of power on the haul — (check high ratio of H.P.-to-loaded-weight in Dumptor story on next page). Dumptor also travels at same speeds in either direction for fast, no-turn shuttle hauling.*

*One-second gravity-dump speeds haul cycles. Dumptor has no troublesome body hoist, no hoist maintenance. Gravity-dump never balks, and never wears out.*

## Convention calendar

**January 10–12 Northeastern Weed Control Conference**
Meeting, McAlpin Hotel, New York, N. Y. Dr. R. J. Aldrich, Farm Crops Department, Rutgers University, New Brunswick, N. J.

**January 15–February 26 Conference for Engineers**
Course on Fundamentals of Non-Destructive Testing, College of Engineering, Columbus, Ohio. Harold A. Bolz, associate dean, College of Engineering, Ohio State University, Columbus, Ohio.

**January 15–17 National Crushed Stone Association**
Annual Convention, Americana Hotel, Miami Beach, Fla. J. R. Boyd, executive director, NCSA, 1415 Elliot Place N. W., Washington 7, D. C.

**January 17 The Beavers**
Annual Awards Dinner, Biltmore Bowl, Los Angeles, Calif. J. W. Watson, assistant secretary-treasurer, The Beavers, P. O. Box 3428, Terminal Annex, Los Angeles 54, Calif.

**January 17–19 Associated General Contractors of Minnesota**
Meeting, Hotel Leamington, Minneapolis, Minn., AGCM, 910 Builders Exchange Bldg., Minneapolis 2, Minn.

**January 23–25 New York State County Highway Superintendents Association**
Winter Meeting, DeWitt Clinton Hotel, Albany, N. Y. Harry R. Mason, secretary, NYSCHSA, Fonda, N. Y.

**January 27–30 Associated Equipment Distributors**
Thirty-eighth Annual Meeting, Conrad Hilton Hotel, Chicago, Ill. P. D. Hermann, executive secretary, AED, 30 E. Cedar St., Chicago, Ill.

**January 28–31 Plant Maintenance and Engineering Show**
Exhibit, Public Auditorium, Cleveland, Ohio. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

**January 28–February 2 American Road Builders' Association**
Combined Conference and Road Show, International Amphitheatre, Chicago, Ill. Louis W. Prentiss, executive vice president, ARBA, World Center Bldg., Washington, D. C.

**January 30–31 Midwest Welding Conference**
Third Annual Conference, Chemistry Bldg., Illinois Institute of Technology, Chicago, Ill. Harry Schwartzbart, supervisor of welding research, MWC, Armour Research Foundation, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16, Ill.

**January 31–February 2 National Bituminous Concrete Association**
Second Annual Convention, Conrad Hilton Hotel, Chicago, Ill. H. K. Griffith, executive director, NBCA, 1145 19th St. N. W., Suite 218, Washington 6, D. C.

**February 4–8 American Society for Testing Materials**
Committee Week, Benjamin Franklin Hotel, Philadelphia, Pa. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia, Pa.

**February 6 The Moles**
Annual Awards Dinner, Waldorf Astoria Hotel, New York, N. Y. Henry T. Perez, chairman publicity committee, The Moles, 11 W. 42nd St., New York 36, N. Y.

**February 11–14 National Sand and Gravel Association and National Ready Mixed Concrete Association**
Forty-first Annual Meeting of the NSGA, and the Twenty-seventh Annual Meeting of the NRMCA, Hotel Statler, Los Angeles, Calif. Vincent P. Ahearn, executive secretary, NSGA-NRMCA, Munsey Bldg., Washington 4, D. C.

**February 15–16 National Society of Professional Engineers**
Meeting, Hotel Francis Marion, Charleston, S. C. Paul S. Robbins, executive director, NSPE, 2029 K St. N. W., Washington 6, D. C.

**February 18–22 American Society of Civil Engineers**
Jackson Convention, Hotel Heidelberg, Jackson, Miss. Don P. Reynolds, assistant secretary, ASCE, 33 W. 39th St., New York, N. Y.

**February 19–20 Concrete Short Course**
Meeting, New Engineering Bldg., Nashville, Tenn. Wm. H. Rowan, CSC, Box 1603, Vanderbilt University, Nashville 5, Tenn.

**February 20–22 Minnesota Federation of Engineering Societies**
Meeting, St. Paul Hotel, St. Paul, Minn. K. A. Feucht, executive secretary, MFES, 619 Guardian Bldg., St. Paul, Minn.

**February 25–26 Georgia Highway Conference**
Sixth Annual Conference, Georgia Institute of Technology, Atlanta, Ga. Radnor J. Paquette, GHC, Georgia Institute of Technology, Atlanta, Ga.

**February 25–27 Association of Asphalt Paving Technologists**
Annual Meeting and Technical Session, Atlanta Biltmore Hotel, Atlanta, Ga. Ward K. Parr, secretary - treasurer, AAPT, 1224 E. Engineering Bldg., Ann Arbor, Mich.

**February 25–28 American Concrete Institute**
Annual Meeting, Statler-Hilton Hotel, Dallas, Texas. Wm. A. Naples, secretary-treasurer, ACI, 18263 W. McNichols Road, Detroit 19, Mich.

**February 26–28 Illinois Highway Engineering Conference**
Forty-third Annual Conference, University of Illinois, Urbana, Ill. John W. Hutchinson, IHEC, 303 Civil Engineering Hall, University of Illinois, Urbana, Ill.

**February 27–March 1 Association of Highway Officials of North Atlantic States**
Meeting, Hotel Traymore, Atlantic City, N. J. Kenneth D. Rice, secretary, AHONAS, c/o State Highway Department, 1035 Parkway Ave., Trenton, N. J.

**February 27–March 2 American Concrete Pipe Association**
Meeting, Shoreham Hotel, Washington, D. C. Howard F. Peckworth, managing director, ACPA, 228 N. LaSalle St., Chicago 1, Ill.

**February 28 Illinois Traffic Engineering Conference**
Ninth Annual Conference, University of Illinois, Urbana, Ill. John E. Baerwald, ITEC, 401 Civil Engineering Hall, University of Illinois, Urbana, Ill.

**February 28–March 1 Highway Engineering Conference of University of Colorado**
Thirtieth Annual Conference, University Memorial Center, Boulder Colo. Roderick L. Downing, conference chairman, HECUC, 207 Engineering Bldg. No. 1, University of Colorado, Boulder, Colo.


# IN ROCK LIKE THIS

## you need Dumptors

When you are loading 1½ to 2½ yards of rock at a single pass, hauling units need plenty of strength to last. With Koehring heavy-duty Dumptor, there's a ton of strength for every ton of payload capacity. *It's built for rock.* Sides and ends of all-welded 6-yard body are heavily rib-reinforced. Double-plate bottom, lined with multiple steel beams, cushions the shocks of rock loading. Bolted or free-swinging kick-out pan adds another ½" steel plate to Dumptor bottom for extra strength.

There's plenty of strength, too, in the heavily-trussed chassis to take constant pounding of heavy loading and rough, off-road hauling. What's more, Dumptor has no leaf springs — just one big snubber-type chassis spring on the steering axle — none on the drive axle. Big drive tires eliminate the need for more springs, absorb loading and hauling shocks — save spring maintenance.

Even with all this heavy-duty strength, Koehring Dumptor® still has more than 6 H.P. for every ton of loaded weight. It accelerates fast, pulls through soft ground with less shifting, climbs 24% grades fully loaded. If you have a tough hauling problem, see your Koehring distributor about this heavy-duty 6-yard Dumptor. Why not call him now?

**KOEHRING COMPANY**

MILWAUKEE 16 WISCONSIN
CK642

*Subsidiaries:* JOHNSON PARSONS KWIK-MIX

### Digs within 12 inches of side obstructions

Off-set digging boom on Parsons 250 Trenchliner® puts trench within 12 inches of curbs, poles, buildings — digs almost directly behind either crawler. Reversible conveyor shifts through machine by power in less than 1 minute, discharges right or left. 250 production capacity: 3½ inches to 9¾ feet per minute. Widths: 16 to 42 inches. Depths to 12½ feet. Four other Parsons Trenchliners are also available in all sizes and types.

**PARSONS • Newton, Iowa**
*(Koehring Subsidiary)*

### Portable, easy-charging 3½-S Dandie® mixer

With this Kwik-Mix ½-bag concrete mixer, charging height is low, only 43 inches. Convenient end-discharge, easy tilting drum, and unobstructed spotting area speed loading into wheelbarrows. Push down tow-pole gives safe, 1-man handling on the job, is easily hitched for trailing. Other models: side-discharge tilter, end-discharge non-tilt. Other concrete mixer sizes up to 16-S. Also: plaster-mortar, bituminous mixers and Moto-Bugs®.

**KWIK-MIX • Port Washington, Wis.**
*(Koehring Subsidiary)*

### 254 to 1321-barrel bulk cement plants

Easy to ship, simple to erect and re-assemble at next site, Johnson silos are all-welded in one piece, 11 or 12 ft. diameter. Single silo capacities: 254 to 611 bbls. Has screw conveyor, bucket elevator, receiving hopper, one or two 1,000-lb. batchers. Larger batcher, extra leg and elevator height available for charging mix trucks. Second silo at ground level increases total plant storage capacity up to 1321 bbls. of cement.

**C. S. JOHNSON • Champaign, Ill.**
*(Koehring Subsidiary)*

VG9

For more facts, use Reader-Reply Card opposite page 18 and circle No. 515


### Thor opens branch office

The Thor Power Tool Co., Aurora, Ill., has announced the opening of a new branch office in Indianapolis, Ind., to serve as a headquarters for regional operations in southern Indiana and western Kentucky. The new Indianapolis branch will be under the direction of Richard E. James, Jr.

"Better hurry. They're not my feet!"

The Ef-ert-less tire spreader handles heavy-ply and wire-cord tires of most sizes.

## Heavy-duty spreader unit handles wire-cord tires

■ A heavy-duty, revolving spreader unit for heavy-ply and wire-cord tires is anounced by Branick Products Co., Inc. The Ef-ert-less tire spreader speeds and simplifies the installation and removal of inside curing rims, air bags, tubes, and flaps. It also aids in inspection and repair operations.

The spreader hooks of the Ef-ert-less unit are designed to provide easy access to the tire without being in the way of work or vision. A large-capacity lift quickly and safely raises the tire to working height.

For further information write to Branick Products Co., Inc., 1213 N P Ave., Fargo, N. Dak., or use the Request Card at page 18. Circle No. 158.

## Belting applications

■ Complete data on conveyor, elevator, and transmission belting is included in the new Boston Woven Hose & Rubber Co. belting catalog. Reference tables and specification information provide a working guide for engineers and contractors. The company's BBC (Balanced Belt Construction) is explained. This feature is said to insure even tension throughout the various plies in the belt and to prolong belt life.

To obtain this catalog write to the Boston Woven Hose & Rubber Co., P. O. Box 1071, Boston 3, Mass., or use the Request Card at page 18. Circle No. 125.

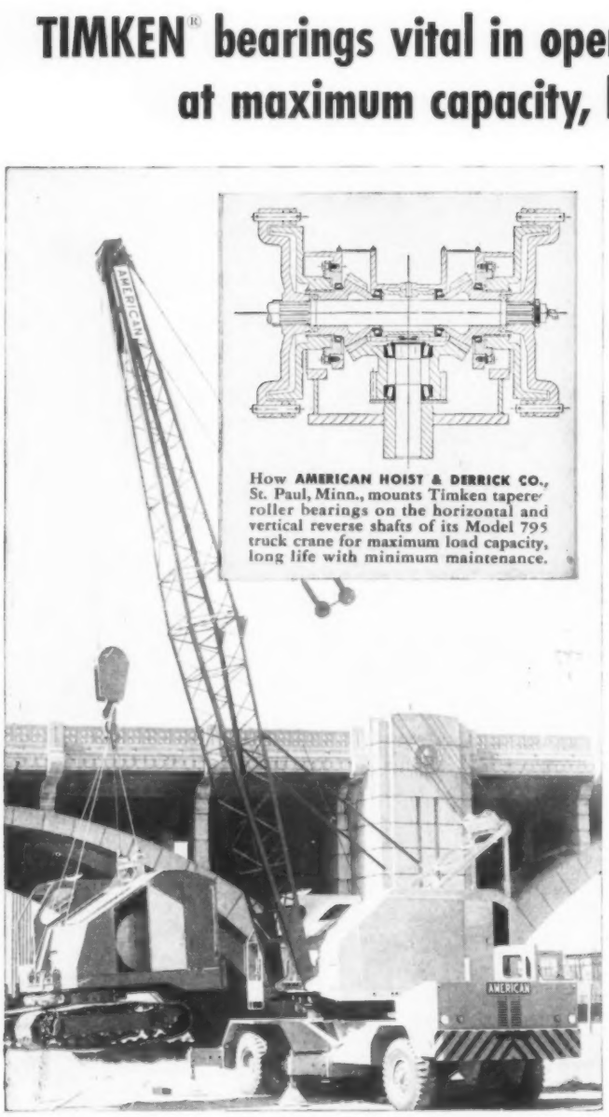
## Single-stage converter

■ Twin Disc's Series 1500 single-stage torque converter is described in a bulletin from the company. Data is included on the single-stage converter fluid circuit, its construction, and applications. The horsepower capacity range, according to the specification table, is 30 to 207. A graph illustrates the horsepower and rpm capacity. Component parts are pictured.

According to the manufacturer, the unit is ideal for use in shovels, loaders, rollers, and graders.

To obtain Bulletin No. 508 write to the Twin Disc Clutch Co., Hydraulic Division, Rockford, Ill., or use the Request Card at page 18. Circle No. 175.


# TIMKEN® bearings vital in operating truck crane at maximum capacity, lower cost




How **AMERICAN HOIST & DERRICK CO.**, St. Paul, Minn., mounts Timken tapered roller bearings on the horizontal and vertical reverse shafts of its Model 795 truck crane for maximum load capacity, long life with minimum maintenance.

THIS versatile American truck crane handles four tough jobs as crane, shovel, backhoe and dragline. The picture shows an unusual use for this 45-ton crane. Loads on the shafts and gears in the drum assembly are very heavy. And these crane units must operate steadily at maximum capacity with simple, easy maintenance. That's why American Hoist & Derrick Co. uses Timken® tapered roller bearings in vital positions—drum shaft, horizontal slewing shaft reverse gears, vertical slewing shaft, retract shaft gear hub, retract shaft intermediate gear, and independent travel vertical drive shaft.

Because of their tapered construction, Timken bearings take *both* radial and thrust loads in any combination. And full line contact between rollers and races provides extra load-carrying capacity. Shafts are held in rigid alignment. Gear mesh is smooth and accurate—wear is reduced to a minimum.

To take the shock loads often encountered, rollers and races of Timken bearings are case-carburized to get hard, wear-resistant surfaces over tough, shock-resistant cores. And true rolling motion makes Timken bearings practically friction-free. As a result Timken bearings provide long bearing life with minimum maintenance wherever wheels and shafts turn.

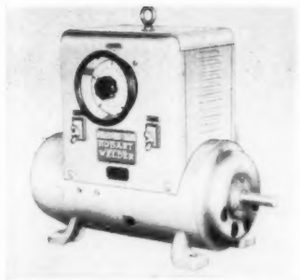
To assure finest bearing quality, we make our own fine alloy bearing steel—America's only bearing manufacturer that does. To be sure you get the *most* for your money, specify Timken bearings when you design, build or buy machines. Look for the trade-mark "Timken" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

*SEE YOU AT THE*
**American Road Builders' Association Road Show**
Space 816 Donovan Hall, Second Floor
International Amphitheatre, Chicago
JANUARY 28 TO FEBRUARY 2, 1957

*This symbol on a product means its bearings are the best.*

TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD
TRADE-MARK REG. U. S. PAT. OFF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 516



The generator component of the Hobart 250-amp air-cooled gasoline-driven arc welder is now being offered alone for those who wish to provide their own power source.

## Arc-welding generator offered without engine

■ For those who wish to make use of their own power source, the Hobart Bros. Co. is offering the generator (without engine) of its 250-amp air-cooled gasoline-driven arc welder. The generator can be operated by direct coupling to a gasoline engine or through a V-belt and grooved pulley connection to an electric motor, gasoline engine, or power takeoff.

The control panel on the front of the generator has a multi-range dual control switch with five main ranges of welding current and 100 steps of volt-ampere adjustment in each range, making available 500 combinations of open circuit voltage and welding current.

The generator requires 23 brake horsepower to be driven at 2,200 rpm on a direct connection to a gasoline engine; when belted to an electric motor, 10 horsepower is needed.

For further information write to the Hobart Bros. Co., Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 152.

## Grommet V-belt described

■ Construction features of the Texrope grommet V-belt, which is said to provide 20 to 50 per cent longer life than ordinary belts, is described in a bulletin from the Allis-Chalmers Mfg. Co. According to the bulletin, the Texrope grommet V-belt has one-tenth the shrinkage, one-third the stretch of an ordinary belt.

To obtain Bulletin 20B6497C write to the Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 2.

*See the Allis-Chalmers Mfg. Co. at the Road Show in the International Amphitheatre, Booths 601, 603, and 621.*

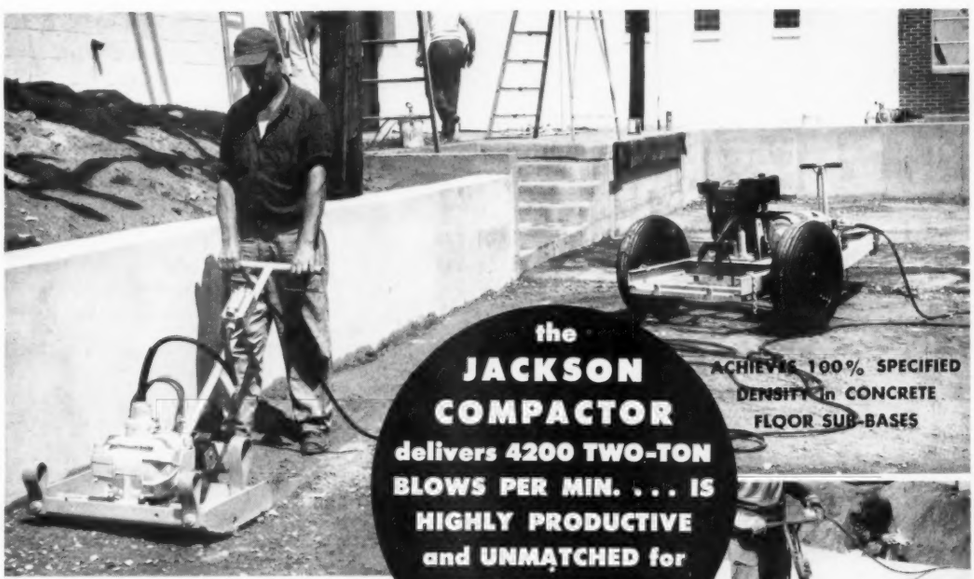
## Armco buys line of gates; builds new plant in Denver

Armco Drainage & Metal Products, Inc., Middletown, Ohio, has purchased the line of Pekrul gates from the Morse Brothers Machinery Co., Denver, Colo. The new acquisition will broaden and round out Armco's line of standard gates which are used in irrigation and water control.

The complete line of Armco gates will be manufactured in the firm's new $1 million plant in Denver.

WHEN THE Whisenant Construction Co. took on the job of rehabilitating some 4,000 square yards of deteriorated runway at Peterson Air Field near Colorado Springs, Colo., an Eveready Model E-15 concrete saw was used for concrete cutting. The self-propelled unit, employing Eveready diamond blades, made 1-inch cuts in the deteriorated area. The surface was then chipped off and fresh concrete poured to bring the slab up to specified thickness. The Model E-15 worked at speeds up to 12 fpm on the job. For more details on the saw, write to the **Eveready BrikSaw Co.**, 1509 S. Michigan Blvd., Chicago 5, Ill., or use the Request Card at page 18. Circle No. 262.

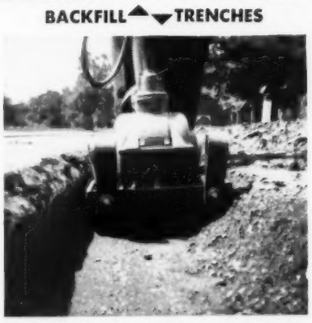
**Visit the Eveready BrikSaw Co. at the Condex Show in the Conrad Hilton Hotel, Booths 146, 147, 148.**

the **JACKSON COMPACTOR** delivers 4200 TWO-TON BLOWS PER MIN. . . . IS HIGHLY PRODUCTIVE and UNMATCHED for VERSATILITY and CONVENIENCE!

ACHIEVES 100% SPECIFIED DENSITY in CONCRETE FLOOR SUB-BASES

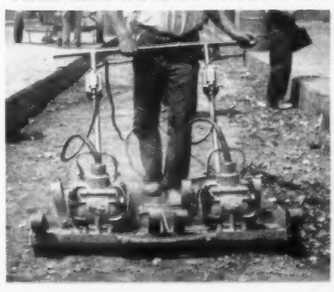
BACKFILL ▲▼ TRENCHES



The JACKSON VIBRATORY COMPACTOR, together with a JACKSON auto-trailer-generator unit equipped to quickly pick up and lower the Compactor, is the handiest, most efficient and versatile outfit imaginable for compacting both granular soils and blacktop in an almost unlimited variety of applications. In granular soils 100% specified density is readily achieved in 10" layers at the rate of 1800 sq. ft. per hour. 5" layers of bituminous mixes are also compacted close to maximum density at the same rate of production. And when a twin hookup is used, such as shown below, one man can easily double this production since the machines are self-propelling and need only be guided by the operator. (THE JACKSON IS THE ONLY COMPACTOR WHICH CAN BE USED IN TWIN HOOKUP.) Quickly interchangeable bases of 12" to 26" widths is another feature that adds to the great versatility of the JACKSON COMPACTOR. For consolidating sub-bases of concrete floors, bridge approaches, compacting in trenches, close to abutments, pavement widening sub-bases, patching and widening bituminous pavement and paving blacktop walks and drives this is the greatest money-making outfit you will discover anywhere. See it at your Jackson Distributor. His name and literature gladly sent on request. Write, NOW!

**JACKSON VIBRATORS INC.** LUDINGTON, MICHIGAN

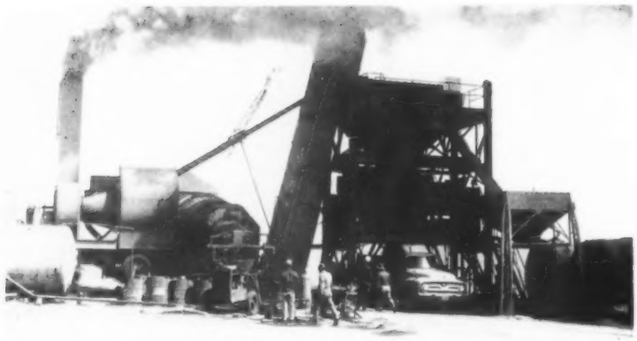
TWIN UNIT DOUBLES PRODUCTION



PAVEMENT PATCHING

PAVING DRIVES and WALKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 517



A Ford batch truck picks up an 8-ton load of hot-mix at the Cedarapids 4,000-pound asphalt plant. Located near the center of the 17-mile project, the plant averages between 1,300 and 1,400 tons daily.

# One paver keeps up with high

***Asphaltic concrete turned out at rate of 1,300 to 1,400 tons daily; subgrade and subbase take large amount of water on improvement job***

Grading and flexible base work done, the contractor on a 17-mile improvement project on U. S. 80 near Odessa, Texas, kept asphaltic concrete paving work moving along quickly on the project, using one paver to handle 1,300 to 1,400 tons of material daily.

This improvement work—one of several such jobs on U. S. 80—was done for the Texas State Highway Department by Cage Bros. and T. C. Cage, San Antonio. One lane of the divided highway was paved first while traffic used the opposite lane, then traffic was routed over the newly paved roadway while the remaining lane was finished.

The entire job involved ripping up the old bituminous highway and rebuilding it to a 24-foot width with 2½ inches of asphaltic concrete. Paving was done in two courses, and a total of 250 pounds of material was used per square yard of road. Double-penetration asphalt treatment was used on the 4 and 10-foot shoulders on each side of each roadway.

#### Tractor equipment grades

Borrow material needed for the grading operation was obtained from designated pits, and some excavation was possible from nearby backslopes and from the depressed median between the two roadways. Cage used four Caterpillar DW20's, two Euclid single-power scrapers, six Caterpillar D8's, two D7's, two International TD-18's, and two Allis-Chalmers HD-20's to move the material. Twin pushers—Caterpillar D8's followed by HD-20's—loaded the Cat DW20's.

Material for the subgrade ranged from clay through caliche, and though


**New! Versatile! Portable!**

*Mobile Drill Model B-40, with a rugged 15 h.p. hydraulic motor to supply positive, continuous drilling action!*

**MOBILE ALL-HYDRAULICALLY POWERED DRILL MODEL B-40**

A COMPLETE LINE OF MOBILE DRILLS

**INVESTIGATE!**

**MODEL B-27**

● Light! Powerful! Field proven for exploratory work in unconsolidated formations. Mounts on Willys vehicles P.T.O. driven. America's most outstanding light, portable rig.

**MODEL B-35**

● A convertible drill for vertical-horizontal work, featuring a new **safety** hydraulic clutch. Willys mounted, operated by P.T.O.

**MODEL B-36**

● A tough, portable rig for heavier formations and P.T.O. operated. Mounts on any 4-wheel drive International or Dodge Power Wagon.

**MODEL B-52**

● **Heavy-duty!** Operated by Ford Industrial Power Plant. Built to withstand terrific torque of toughest formations. Adaptable to a really extensive list of uses.

**Cores and augers vertically or horizontally. Brings economy to under-highway boring.**

Light, powerful, low-cost drilling . . . yours, with the new Mobile Drill Model B-40. This one-man-operated rig easily mounts or dismounts on the front, rear, or side of *all* vehicles, including wheel or crawler tractors. Cores with air *or* water to 200', augers to 75' in *minutes*. The B-40 quickly converts to *any* degree in a 360° angle, cuts costs on underground water, gas, and power-line installations. Light enough for air transport to remote areas, powerful enough for a complete range of tough exploratory jobs. Never before has such a LOW COST drill with such amazing power and versatility been offered. Write, 'phone, or wire today for complete information!

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*World's Largest Manufacturer of Light Vehicle Powered Drills*

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**Here's the business end of a heater**

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

If you want *circulated warm air* indoors, *powerful spot heating* outside, if you want to *dry plaster*, pour and *cure concrete* and *keep the job rolling* in any weather, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

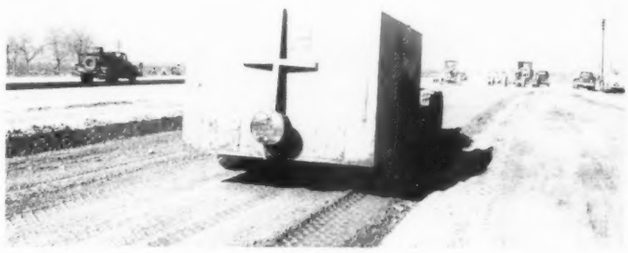
**MASTER VIBRATOR COMPANY**
**310 Stanley Ave., Dayton 1, Ohio**

MASTER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 519

# with high output of hot-mix plant

The single Barber-Greene finisher lays half the width of the 24-foot roadway on one side of the median. A shop-built taper bar attached to one side of the spreader frame provides a tapered edge at the inside shoulder.



Working over the flexible base, a Ferguson 50-ton four-wheel roller compacts a 5-inch lift in approximately four passes. Surface compaction will be done by smaller pneumatic units.

it loaded well and compacted easily, it was so dry that an unusual amount of water was needed to process the material.

Up to 400,000 gallons of water was hauled to the road every day, largely from the Odessa end of the project, by as many as nine truck-mounted water trailers. Once the material had an optimum moisture content, good compaction was developed, even on relatively thick lifts, by two Ferguson 50-ton pneumatic rollers. These machines made from four to six passes to develop 95 per cent of Modified AASHO density requirements. Two sets of Gebhard sheepsfoot rollers did compaction work in some small areas.

**Double crushing setup**

Three pit sites, scattered over the job, supplied material for rock production, and the pit nearest the center of the job also supplied material for all aggregates for the hot mix. Two identical rock plants in use on the job consisted of Pioneer feeders with Diamond jaw-crusher unit and a balanced Diamond crushing and screening plant. Vibrating screens were used over the surge bin storing the hot-mix aggregates.

In the pits, some blasting was necessary to loosen the formation so that the material could be handled by power shovels. Two Gardner-Denver air compressors, two Gardner-Denver wagon drills and a Gardner-Denver drill mounted on an Air Trak self-propelled carriage were used to put down blast holes. Trojan bag powder was used to loosen the rock, which a power shovel loaded to a fleet of four

*(Concluded on next page)*

McCARTER'S NEW INSTALLATION . . . for Harlem Blacktop, Inc., Wescosville, Pa. A 2½ ton portable Asphalt mixing plant. Designed and manufactured in our own factory.

for SPEED, PRODUCTION and PORTABILITY

McCarter Asphalt mixing plants are your answer . . .

**SPEED** Goes up fast, dismantles easily with a minimum of crew.

**PRODUCTION** Full flexibility for the individual customer or for high tonnage runs.

**PORTABILITY** Sectioned for easy moving, large or small jobs, under varying conditions.

**INDIVIDUAL UNITS AVAILABLE** Dryers (hot or cold material) Mixers, Buckets, Hoppers, Bins, Feeders, Collectors, Elevators and Steel Structures.

**REPAIRING AND REMODELING** Get better production, more efficient operation from your old plant. We specialize in this service.

Engineering Counseling available to you at no obligation. We can tailor our equipment to your specifications.

THE Mc CARTER IRON WORKS, INC. NORRISTOWN, PA.

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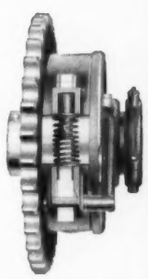
"the Clutch of Robust Refinement"

Especially Designed for Earth-Moving and Road Building Equipment

BUILT TO TAKE PUNISHMENT ON TOUGH JOBS such as the tremendous multi-billion road building program will require for many years. Up to 300 hp — brutally strong with overload capacity — embodying the skills and experience of over fifty years. CONWAY CLUTCHES are designed to start . . . stop . . . or run machinery . . . efficiently, economically, worry-free.



MANY TYPES AND SIZES

A wide variety of models and sizes enables you to select and install the clutches best fitted for your purpose.

Write for Bulletins and Engineering Suggestions

THE CONWAY CLUTCH CO.

1109 Marshall Street Cincinnati 25, Ohio

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(Continued from preceding page)

Koehring Dumptors. These delivered the rock to the crusher feeder trap.

Manipulation and compaction of the flexible base material followed standard procedure. Two 5-inch compacted lifts, with an average moisture content of 12 per cent, were laid, blended and compacted. The material was placed by dump trucks, and water was added to it continuously while several Caterpillar No. 12 motor graders did a blading job. The graders then cut thin lifts out from the toe of the windrow, and several Tampo and Grace pneumatic rollers, working behind Farmall M rubber-tire tractors, compacted the material.

On long, straight stretches, most of the small pneumatics were eliminated and a Ferguson 50-ton, four-wheel unit substituted. This machine compacted the entire 5-inch lift in about four passes. The motor graders generally spread the material in two thicknesses when the heavy pneumatic roller was employed. This basic compaction completed, the surface was bladed tight by a motor grader and surface compaction was applied by one of the small Tampo pneumatics.

#### One hot-plant used

One hot-plant, set up near the center of the job, turned out the entire tonnage of hot-mix material. It consisted of a Cedarapids 4,000-pound asphalt batch plant, the required auxiliary equipment, and a storage space for materials.

The asphalt cement, an OA-135 product, was transported to the plant from the Cosden Refinery at Big Spring, Texas, by insulated asphalt transports owned by Cage Bros. It arrived at the job still at pumping temperature and was transferred to two horizontal tanks, which provided about 20,000 gallons of storage, by a Viking asphalt pump. A full-circulating system ran from the tanks to the plant to keep the hot pot supplied.

The asphalt content of the mix, which ran about 6.5 per cent, was weighed out instead of being metered.

The mineral aggregate turned out by the Diamond rock plant was stockpiled in four sizes—from fine sand through ¾-inch-minus—within easy reach of the crane that kept the plant bins supplied. The crane used an Owen ¾-yard clamshell to charge each of the four bins with the mineral aggregate, which was usually quite dry, averaging not more than three per cent moisture.

The mineral aggregate was picked up by cold bucket elevators under the feeder and passed to a revolving single-drum drier on the plant. No. 5 fuel oil, used at a rate of about one gallon per ton of aggregate, was fed to the four Hopkins burners at the firebox end of the drier. The rock passed through a totally enclosed hot elevator to the screening system at the top of the bins to be separated into four basic sizes that were blended during the weighing process. Blended rock then dropped into the 4,000-pound pugmill, together with the bitumen.

The paving material was hauled from plant to road by a fleet of Ford F-600 batch trucks owned by J. G. York, Waco. Each of the trucks hauled eight tons per trip.

#### Laydown work

The high plant output was put down in the 12-foot lanes by one Barber-Greene finisher, which had no difficulty with traffic since barricades and flagmen routed cars to one lane while the other was being paved. A tapered edge, formed at the outer side of the roadway for safety's sake, was made with the help of a small shop-built taper bar attached to one side of the spreader frame.

Initial rolling was done by an Ingram 3-wheel steel machine that kept close to the paver. Final rolling was done by a Huber 8 to 10-ton tandem steel wheel roller. A Littleford pressure distributor was used in the construction of the asphalt-penetration shoulders, while rock chips were applied by spreader box from the rear of trucks.

#### Personnel

This project was under the general supervision of District 6 at Pecos, which has R. L. Faltinson as district engineer. His assistants in the field included A. W. Pope, senior resident engineer, Vernon Wilkerson, resident engineer, and Henry Shannon, chief inspector. The contractor's field operations were under the supervision of Charles Ditmore and general superintendent Leslie Massey. THE END

## Smith Engineering appoints

Robert G. Morton has been appointed Pacific Southwest district manager for the Smith Engineering Works, Milwaukee, Wis., manufacturer of Telsmith crushers. With headquarters at 1950 Santa Fe Ave. in Los Angeles, Calif., Morton will cover the states of California, Arizona, New Mexico, Colorado, Utah, and Nevada.


# 8-speed transmission pays off

## on Arkansas road project

Graves Brothers, of Pine Bluff, Arkansas, were awarded a subcontract to rebuild 2½ miles of gravel road on Arkansas Route 1, from Pendleton to the Arkansas River levee. The job included widening, raising, and leveling road grade, and building an approach to top of the earthfill levee.

Graves used an 8-speed Adams 550 motor grader and a crawler-drawn scraper to rebuild the roadway. Two D Tournapulls hauled dirt for the road-approach and a 6-speed motor grader spread and graded the fill.

#### "550" does heavy dirt work

Contractor assigned his 8-speed Adams grader to heavier work, where the machine's greater number of power-speed combinations could be best put to use. "550" rooted out brush along the roadside, cut new, wider ditches, and graded backslopes where necessary. Working with the tractor-scraper in cut areas, the grader bladed the clay-sand subsoil down to final sub-grade.

The Adam's ability to develop full-horsepower in any of the 8 forward and 4 reverse speeds allowed operator to take a full-blade cut, to grade at fastest rate practical. For each operation he had the "right" combination of power and speed . . . full power at 2.2, 3.2, and 4.6 mph. Thus, on the road-rebuilding portion of the job — where long, steady production cuts multiplied the working advantage — the Adams 8-speed transmission paid off in extra work at no extra cost.

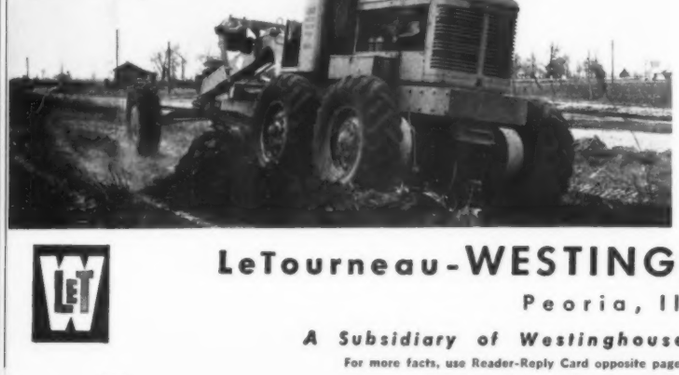
#### Speeds general grading, too

The company was also ahead on lighter phases of this work. With more power-speed combinations, the Adams did all blading at fastest practical rate . . . spread fill, leveled sub-grade, shaped shoulders, spread gravel, and handled finish-grading.

W. A. Cassity, Superintendent for Graves Bros., likes the "550" and its wide speed range . . . says, "It has plenty of power, and operates easily and economically. I especially like the Adams fast reverse of 13 mph and its 25 mph road speed."

#### Power-steer makes operation easier

Grader operator, Ranal Bozeman, has a special reason for liking the Adams. He works a 10-hour shift, steers and operates the "550" entirely with his right hand, since his left is missing. Operator Bozeman finds that Adams power-steer gives him excellent control of his machine and makes possible more precise blading. The mechanical-hydraulic steering system gives him the "feel" of the road — so necessary for accurate work and for safe driving on open highways and in traffic. Even with his handicap, he makes accurate blade adjustments easily with smooth-operating controls.



With only one good hand, Ranal Bozeman easily operates "550", 10 hours a day . . . does an outstanding job of grading.

#### Get acquainted with Adams

You'll like Adams graders, too, for the same reasons that pay off for Graves Brothers. You'll find an Adams can do more hard work . . . quickly, accurately, and with minimum of operator effort. They grade more dirt . . . save you time and money on every construction job.

Why not get details on the complete Adams line: 6 models, 60 to 190 hp, including POWER-*Flow* model with torque converter. Write or phone for information. We'll be glad to arrange a demonstration.

Adams, POWER-*Flow*—Trademark, Tournapull—Trademark Reg. U.S. Pat. Off. AG-50-H-b-5

**LeTourneau-WESTINGHOUSE Company**

Peoria, Illinois

*A Subsidiary of Westinghouse Air Brake Company*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 522

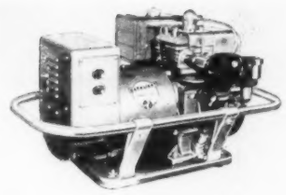
"My husband just swallowed a bulldozer."

## Gasoline-electric set operates at 1,800 rpm

■ A new series of 1,800-rpm air-cooled gasoline-electric sets is announced by the Katolight Corp. The units are available with carrying brackets or wheeled dollies for portable applications.

The new electric plants are driven by 4-cycle Briggs & Stratton gasoline engines. They are offered with both manual and electric remote starting. The latter can be supplied with a transfer switch so that the unit can be used for standby emergency service.

The remote units utilize heavy dc windings on the armature for starting and charging the battery. The electric remote sets are supplied with a special ball end to accommodate all relays, receptacles, and metering devices.



The portable units in the new series of Katolight 1,800-rpm gasoline sets are equipped with either carrying brackets (above) or wheeled dollies.

For further information write to the Katolight Corp., Box 891-8, Mankato, Minn., or use the Request Card at page 18. Circle No. 171.

## Submerged-arc welders

■ Automatic submerged-arc welders are described in a new booklet from The Lincoln Electric Co. Covered are the Lincolnweld LAF-3 for DC welding, the LAF-4 for AC welding, and the LAF-5 for DC welding in the field. The LAF-5 is especially recommended for such work as double jointing of pipe, hardsurfacing of tool joints, and rebuilding of dipper teeth and scraper blades. It is designed for automatic welding where no three-phase current is available. Current is supplied by a Lincoln Shield-Arc SAE-600 engine-driven power source. The booklet also describes the attachments available for use with the welders, including the two-electrode Twinarc for tandem and side-by-side welding, and the Spreadarc oscillating unit for producing wide deposits. In addition, there is a section on ac and dc power sources.

To obtain SB-1355 write to The Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 12.

## Motor grader accessories

■ Attachments and accessories for the Model D motor grader are pictured and described in a pamphlet from the Allis-Chalmers Mfg. Co. Attachments for the grader are a scarifier, rear-dump loader, shoulder maintainer, windrow eliminator, and snowplows. Shiftable moldboard, leaning front wheels, power circle turn, and fully enclosed stand-up cab are accessories for the Model D. Brief specifications are given.

To obtain the pamphlet write to the Allis-Chalmers Mfg. Co., P. O. Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 182.

## Athey Products news

Harry S. Jones has been appointed assistant sales manager in charge of domestic sales for the Athey Products Corp., Chicago, Ill. For the past three years Jones was the firm's district representative in the north central states.

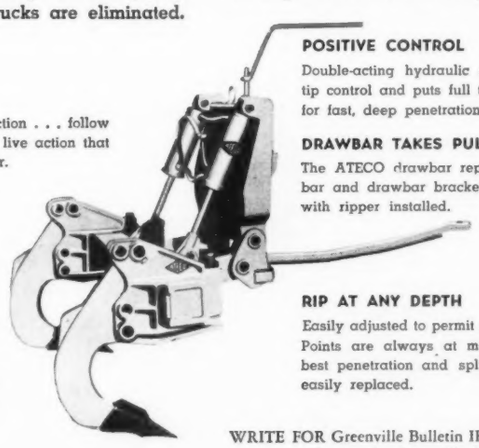

# TREMENDOUS RIPPING TEAM

**The tremendous power of the IH TD14, TD18 or TD24, plus the 10,000-pound Greenville tractor-mounted rock ripper shatter rock and packed earth for easy scraper loading. On many jobs explosives, shovels and trucks are eliminated.**

**Put this power-packed team to work for you. Your IH dealer can give you the facts. Let him show you how you can save as much as 25% on any earth or rock moving job.**

**LIVE SWIVEL ACTION**
Shanks swivel 15° in either direction . . . follow tractor like a trailer. Points have live action that shatters rock like a jack hammer.

**RUGGED POWERFUL SHANKS**
Scientific contour gives extra strength at strain points and pulls points down deep . . . rocks roll out and clear of headframe. Made of tough, heat-treated, manganese-moly steel. Mount one, two or three shanks as needed.



**POSITIVE CONTROL**
Double-acting hydraulic system provides fingertip control and puts full tractor weight on points for fast, deep penetration.

**DRAWBAR TAKES PULL**
The ATECO drawbar replaces the tractor drawbar and drawbar brackets. Clevis is accessible with ripper installed.

**RIP AT ANY DEPTH**
Easily adjusted to permit settings as deep as 24". Points are always at most desirable angle for best penetration and splitting action. Points are easily replaced.

WRITE FOR Greenville Bulletin IH-156. It gives complete data on the Greenville-Ateco ripper.

ATECO

**GREENVILLE**
**STEEL CAR COMPANY**
**ATECO DIVISION**
Greenville, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 523

# Accident, liability provisions in the construction contract

by MAX R. SCHRAYER vice president, Associated Agencies, Inc. Chicago, Ill.

Estimating work and being certain that all of the costs are properly included is extremely difficult for the contractor. Failure to build properly can cause financial ruin. But no less a danger today is that of being sued and of having a sizable judgment entered that can cause bankruptcy or at least impair capital to such an extent that continued operation is impossible or at least extremely difficult.

Contractors are particularly responsible for negligence in their operations. Construction work is usually hazardous and if accidents result, so too does injury and loss.

All contractors carry liability insurance, but few understand what is covered and what is not covered on the policy contract. Failure to understand the conditions and exclusions in the policy may cause bitter disappointment and financial loss to a contractor who is trying to be conscientious.

### Several policies

There are several types of liability policies for the contractor and each one is different. It is difficult, if not impossible, for the contractor to select the proper one by himself. He should, of course, employ the services of a competent insurance broker or agent who understands his problems as well as the insurance contracts and can select the proper coverage for him.

The simplest contract, and one that is now considered "old fashioned" is a "Schedule Policy". This contract specifically describes the contractor's operation and, subject to certain conditions and exclusions, insures the contractor for specifically listed hazards.

Much better is the "Comprehensive Liability Policy" which is written from exactly the opposite point of view. It covers the contractor for all liability but does not list specific exceptions. This means that if the contractor listens attentively to the insurance man explaining the contract, he will understand the exclusions, and know that the policy covers him in every respect excepting those that are distinctly excluded.

The first step, therefore, after employing a competent insurance man is to select a "Comprehensive Policy".

### Accident must occur

The next step is to understand that the liability policy protects the in-

The Bethlehem shop-fabricated bar mats are made up of nine No. 5 bars and seven No. 3 bars.

## Continuous Reinforcement

### IN 2-MILE STRETCH OF HIGHWAY NEAR YORK, PA.

During the relocating of sections of U. S. Route 111, between Harrisburg and York, Pa., it was decided to pave a two-mile stretch using continuous reinforcement instead of transverse contraction and expansion joints and standard reinforcement.

This longest stretch of continuously reinforced highway in Pennsylvania is four lanes wide, with a 20-ft medial strip. Each lane is 12 ft wide. A 9-in. slab was laid.

No transverse joints were used. Instead, special mats of deformed bars were laid to form the continuous steel reinforcement. The mats, which were furnished by Bethlehem, had a weight of approximately 181 lb per 100 sq ft and were placed at the midpoint after the first course of concrete had been struck off, just as ordinary mats are placed in reinforced-concrete paving, without any necessity for accessories.

H. J. Williams Company, of York, Pa., laid the continuous steel reinforcement and paved this two-mile stretch of Route 111.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

*On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation*

**BETHLEHEM STEEL**

BETHLEHEM STEEL

For more facts, use Reader-Reply Card opposite page 16 and circle No. 524

*This is the second of a series of articles on insurance and construction contracts by Max R. Schrayer, vice president of Associated Agencies, Inc., Chicago, Ill. Mr. Schrayer, a graduate mechanical engineer from the University of Michigan, is a Chartered Property and Casualty Underwriter, and is an officer of the Chicago Board of Underwriters. The object of this series is to help the contractor and owner draw up a clear and well defined construction contract involving insurance.*

sured from loss due to his negligence when an accident occurs that either injures someone or destroys or damages another's property. Note that an accident must occur. The policy does not cover losses unless they result from an unexpected event. If damage is done to property through some deliberate processing, more than likely no accident will have occurred and the loss will not be covered by the insurance contract.

For example, if a painter deliberately coats a wall and the paint somehow causes damage to the building, the insurance company will refuse to pay for the loss on the ground that no accident has occurred. The loss was the result of a deliberate action on the part of the contractor; no accident took place. It should definitely be understood by the contractor that his liability insurance policy only protects him from loss that is caused by accident.

Some relief can be obtained by insisting that the word "occurrence" be used in place of "accident". It is not certain that this greatly increases the coverage but it is a more general term and insurance companies are willing to use it in regard to bodily injury but not in regard to property damage. The losses that develop are usually in reference to property damage coverage. Substitution of the word "occurrence" for the word "accident" in the bodily injury portion of the policy will not cover a property damage loss. Nevertheless, every insured contractor should insist that the word "occurrence" be used wherever possible.

Next the insured should understand that the standard contract provides coverage for him only with regard to liability imposed by law, and not for liability accepted by him under contract. This means that in cases where the law holds him liable, the insurance company will defend and pay the loss. Where the liability is voluntarily accepted by the contractor, the standard policy will not protect him. Often a contractor is asked to "hold-harmless" the owner of the property for any liability that the owner may have. This is not a liability imposed by law, but is a liability voluntarily accepted by the contractor and this must be specifically insured.

It is important that the policy purchased by the contractor have a provision covering contractual liability in addition to legal liability, and it is equally important that the contractor understands that even if this provision is in the contract, there is no coverage (with some exceptions) unless each individual "hold-harmless" agreement is specifically described and specifically insured. There are a few standard contracts that are included in the coverage. These are ordinary written leases, sidetrack agreements, municipal ordinances or easements, and elevator or similar service contracts. Be certain that contractual operations are included and that each contract is specifically insured.

#### Exclusions

Thirdly, it is important to note the exclusions in the standard contract. Unless special arrangements are made to have some of the exclusions removed, the coverage is rather severely limited.

Any loss involving automobiles, watercraft, or aircraft, is eliminated from the policy and can only be covered by being specifically added. Any losses involving the workmen's compensation act are excluded because one is expected to carry workmen's compensation insurance.

Losses resulting from war, hostilities, or atomic fission are excluded and probably cannot be added specifically under ordinary circumstances. Losses resulting from state laws regarding the serving of liquor or intoxicating beverages are presumed to be a special kind of liability and these policies are not designed to cover this type of loss. Accidents re-

# Which tires would you put on this truck?

**SITUATION: Excavating for highway between Bonne Terre and Halifax, Missouri, Clarkson Construction Co. trucks haul dolomite from 1,000-ft. long, 20-ft. deep cut to nearby fill. Terrain—rough, with steep 30° downgrade. Average load of 23.49 cu. yds. weighs 61,074 lbs.**

**FIRESTONE'S RECOMMENDATION:** Rock Grip Excavators for dual drives withstand load shocks, ward off cuts and bruises. Angled treads prevent side slipping. Rib Excavators up front make steering easier. These tires are built with tough cut-resistant tread rubber and Safety Tensioned *Gum-Dipped*® nylon cord bodies for extra strength and impact resistance.

**JOB RESULTS:** Clarkson trucks operate 10 hrs. daily in 5-min. cycles. *No downtime has been caused by tire failures!* Operators express complete satisfaction with lowered costs and raised performance standards, directly resulting from the recommendations of their Firestone Sales Engineer. He's the man who knows all tires and understands how to use them best for your profit, too. Contact him today—through your local Firestone Dealer or Store.

**SUPER TRANSPORT**
Most widely used heavy-duty tire for long, low-cost highway performance.

**SUPER ALL TRACTION**
Rugged, deep treads for off-road traction; smooth highway operation.

**ROCK GRIP EXCAVATOR**
Toughest tire ever built for severe off-road service. It's cut-resistant too!

**RIB EXCAVATOR**
Rugged, thick-bodied tire with great lateral stability for easy steering action.

Firestone

Enjoy the Voice of Firestone on radio or television every Monday evening over ABC

Copyright 1957, The Firestone Tire & Rubber Co.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 525

(Continued from preceding page)

sulting from blasts, collapse, or damage to property below the surface of the ground are almost always excluded. A contractor who contemplates doing this type of work should see to it that his contract is extended to cover him in event of accidents of this nature.

Most important of all is the common exclusion of damage to property under the care, custody, and control of the contractor. This is almost always excluded and causes no end of embarrassment and loss. The explanation is that the insurance company expects to protect the contractor for injury to others and damage to the property of others, rather than injury to himself or damage to his own property. Property upon which he is doing work is considered his own property for the purpose of this type of insurance. If he damages the property upon which he is working, the loss would result from his lack of skill or his carelessness on the job, rather than an unfortuitous occurrence in which an innocent party is injured.

For example, if a contractor or a subcontractor is working on a partially finished project and, during the course of his work does damage to that part of the building that is completed, the damaged property is presumed to be under his care, custody, and control and he cannot rely upon the insurance company to pay the loss. On the other hand, the insurance contract will protect the contractor if adjoining property or property not under the contractor's control is damaged.

These are instances where the exclusions have been amended and this limitation has been removed, but they are very rare and insurance companies usually feel that removing this exclusion is almost a warranty for the competence of the contractor.

#### Important clause

The contractor must remember that the standard policy covers accidents that occur during the course of the operation or while the work is being done. The policy follows the operation of the contractor any place he goes, but once the project is finished and delivered to the owner, the insurance terminates. Sometimes a loss develops after the project has been completed and it can be shown that the loss was due to the faulty workmanship of the contractor. Suit may be brought, judgments obtained, and severe losses suffered because of an accident resulting from negligence that does not become apparent until months later. This must be covered by endorsing the policy to provide for insurance against accidents which occur after a job is done. Every contractor should be sure that his policy contains this clause or he may find himself bankrupt as a result of an accident that occurs long after his work has been completed.

Another serious consideration is the liability of a general contractor for the negligence of his subcontractors. This may even extend to omissions or errors that occur between the work of the subcontractors. A comprehensive liability policy does not automatically cover the contractor's contingent liability, but for a small additional premium this can be obtained.

Two other points should always be remembered. It is necessary that the insurance firm selected is financially responsible, genuinely cooperative, and staffed to give proper service. Finally, it is important that the limits selected are high enough to provide sufficient coverage even for the most unexpected accidents.

(To be continued)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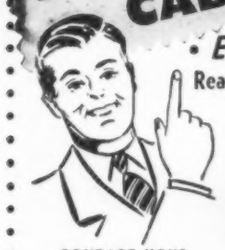

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36 Jefferson Avenue PHONE 3959 Salem, Mass.

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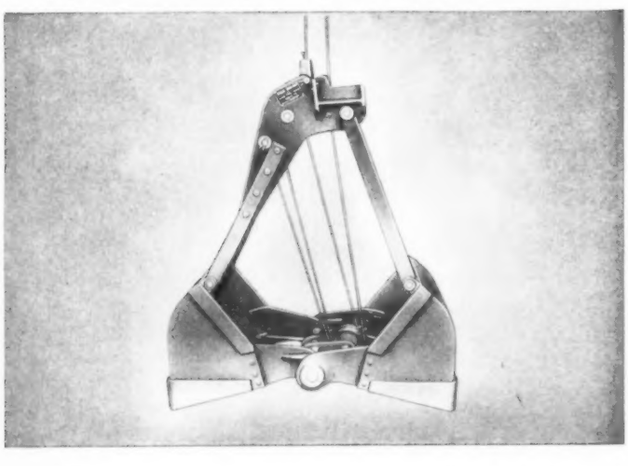
ATTENTION . . . Lightweight Crane Owners

ERIE'S NEW 3/8 YD. CLAMSHELL GIVES YOU ALL THE FEATURES OF REGULAR 2-LINE MODELS



Quick Way, Schield Bantam, Sargent, Dixie, Little Giant, Mitey-Mite, unit crane and other light weight crane owners—ERIE's new 3/8 yd. bucket is built to help you get the most pay load out of your equipment.

Rigid, one-piece, welded head; thick, strong corner bars; oversize bearings; massive hinges and low silhouette—all the features that make ERIE buckets standard for the world—scaled to fit your requirements. You'll be agreeably surprised at the job this new bucket does. We who developed it were surprised and we expected a lot.

Once you try ERIE's new 3/8 yd. clamshell, we're sure you'll agree with us—it's the hardest digging, longest wearing and easiest handling bucket you ever rigged to a light weight crane.

Heat Treated teeth on all ERIE buckets are guaranteed for the life of the bucket against breaking. A new set if they break.

These features make ERIE the bucket experienced operators prefer:

1. Top closing power from block and tackle, plus lever arm construction, plus precision balancing.
2. Treated steel teeth and high carbon steel lips bite up full payloads even in clay and gumbo.
3. Rigid, one-piece, welded head that shrugs off bumps and jars. No shimmy. No wobble.
4. Two-line, continuous reeving. Adds up to 50% to cable life. Less down-time for reeving.
5. Low headroom for fast work in tight quarters; low center of gravity for easy positioning.

We will attend A.R.B.A. ROAD SHOW JAN. 28—FEB. 2, 1957

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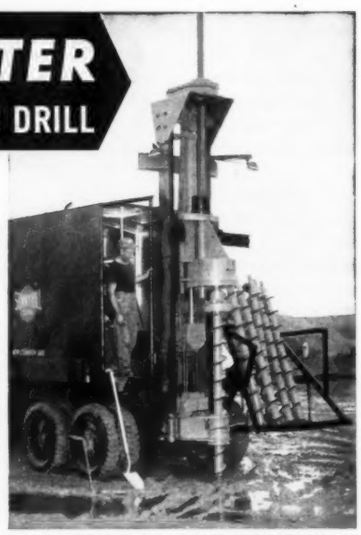
40% FASTER THAN ANY OTHER DRILL



• The McCarthy Vertical Auger Drill cuts drilling time in earth, clay, compacted sand and gravel, hard pan, shale, sandstone and rock as much as 40%. Rugged construction permits you to drive 2 to 24-inch augers to depths of as much as 125' faster than any other drill. Get the facts on the powerful McCarthy today. See how you can complete shot hole, exploration drilling, foundation holes, dewatering operations, well drilling, highway construction and heavy contract work faster than ever before. The versatile, vertical McCarthy gives you more than any other drill. Write for Bulletin M-100 now. Let us show you how you can turn new profits on your drilling job.

McCarthy Vertical Auger Drill Model 106-24

SALEM MANUFACTURED BY THE SALEM TOOL CO.

806 S. Ellsworth Ave., Salem, Ohio

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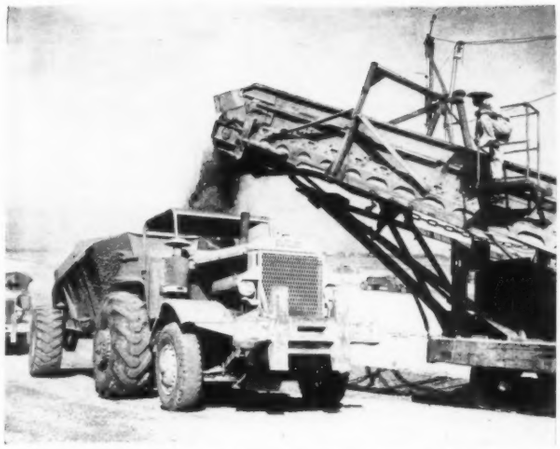

PRECIOUS GRAVEL from the Guarico River in Venezuela—the only source available within 200 miles—is loaded into a Euclid for transport to the Guarico Dam near Calabozo. The $50 million dam, which will create a 94-square-mile lake that will irrigate 300,000 acres for cattlemen, is being built with the largest force of earthmoving equipment ever assembled in Latin America since the Panama Canal was built.

## Design and construction of timber is topic of book

A comprehensive timber design reference and a practical field handbook are the two purposes of "Timber Design and Construction Handbook", prepared by the Timber Engineering Co. Some of the topics covered in the book include wood properties, commercial lumber standards, preliminary design considerations, post-and-beam construction, roof trusses, and arches.

Remaining chapters deal with special framing, exterior structures, plywood, design standards, and fabrication, assembly, erection, and maintenance. A glossary, abbreviations of terms, and an index conclude the 622-page text. Job photos, diagrams, etc. are included.

Published by Dodge Books, 119 W. 40th St., New York 18, N. Y., it is priced at $12.75.

## Hewitt-Robins creates new sales territory

The Industrial Products Divisions of Hewitt-Robins Inc., Stamford, Conn., has created a new sales territory to be known as the San Francisco sales district. Theodore C. Zinter has been named manager of the new district office, which will cover the northern half of California, most of Oregon and Washington, and portions of Idaho, Montana, and Nevada. This area was formerly served by the firm's Los Angeles office.

Mr. Zinter was previously manager of Hewitt-Robins' belt sales and development department in Buffalo, N. Y. He is succeeded in that post by Merrill H. Hickey, the former manager of belt design.


Buy MADESCO, and you benefit by over thirty years specialized experience in designing blocks for countless specialized needs. Available with heavy steel (or wood) shells, heavy fittings, plus iron or steel graphite bronze, self-lubricating sheaves, bronze or antifriction bearings. Madesco features sum up to safe, fast lifting, longer rope-life, trouble-free service. Consult your distributor for standard blocks for delivery from stock . . . and meantime write for our complete catalog. Special engineering services and recommendations also available.

MADESCO TACKLE BLOCK CO., Easton, Pa.

MADESCO BLOCKS

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Faster, Safer, More Economical and Look—No Wire Waste!

IDEAL®
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Puts wire waste to work!

Yes—IDEAL reel stops costly wire waste. *Actually puts it to work.* Gives 33% more usage per pound of wire, on average. Increases tying speed 25% . . . often much more. Safeguards workers. Discover for yourself how IDEAL reel can speed your tying jobs . . . *safely* . . . and cut job costs, quickly and economically.

**You save time**—when you change from outmoded wire-tying methods to IDEAL reel. Get 6 to 8 more ties per minute than with clumsy, over-the-head wire coils. No chance for time-consuming tangles, bent or kinked wire. *Saves wire . . . and money, too.*

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Phone 5-7389

Ideal Reel Company 328 Harahan, Paducah, Ky.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 530

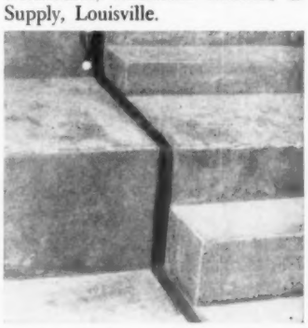
## New Joint Sealing Compound "Stays Put" . . . keeps stadium joints sealed permanently

Determined to insure that concrete joints in the new Kentucky Fair Exposition Center and Stadium at Louisville, Kentucky would stay sealed under all conditions, Fred Elswick & Associates, Louisville, Ky. architects and engineers, set up stringent specifications for the joint sealing compound.

They called for a material that had no cold flow, that would not become soft and tacky during summer months, and at the same time bond to concrete and keep the joint sealed during extremes of temperature ranging from −10° F. to 110° F. Ease of installation was another important factor.

"VERTISEAL"—a new cold-applied, self-vulcanizing joint sealing compound manufactured by Servicised Products Corporation, Chicago, was selected for the job because it met and even exceeded the specifications set up. Tests indicated that "VERTISEAL" had great tensile strength, highly favorable elongation and penetration characteristics plus the desired absence of cold flow after cure.

Installation of the "VERTISEAL" was done by General Insulating & Roofing, Inc. of Louisville. "VERTISEAL" is a two-component material and correct quantities of both components are shipped in a single one gallon container. After mechanically mixing the components, the material was ready for installation. Caulking guns were used to apply the material to vertical joints in the stadium's risers. A pouring grade of "VERTISEAL" was mixed in the same manner and simply poured into the horizontal joints from suitable containers. J. O. Durham, Superintendent of General Insulating states: "VERTISEAL" was very satisfactory in every respect. We had no trouble in mixing or installation. Our men were able to seal vertical and horizontal joints with equal ease." Technical assistance and service on "VERTISEAL" were provided by the Manufacturers Distributor, American Builders & Supply, Louisville.



24 to 48 hours after installation, the "VERTISEAL" set up into a tough, resilient, self-vulcanizing cured rubber seal which "stayed put" and required no touch-up or further attention. "VERTISEAL" is available in either black or white, and in two consistencies—troweling and gun grade for vertical or sloping joints and pouring grade for horizontal joints. Because it is equally effective and maintains excellent bond with concrete, metal, glass or any combination of these, it is widely used as a caulking compound. Typical applications include architectural expansion joints above grade, exterior glass with metal frames, sealing panels in metal-clad structures, masonry coping, swimming pools, etc. A special "VERTISEAL" brochure is available on request from the manufacturer.

**SERVICISED PRODUCTS CORPORATION**
**6051 WEST 65th STREET, CHICAGO 38, ILLINOIS**

See us at Booth No. 104 (near Maine Turnpike & Avenue H) ARBA Show, Jan. 28-Feb. 2, Chicago Amphitheatre.
For more facts, use Reader-Reply Card opposite page 18 and circle No. 531

FIVE MINUTES are all that are needed to set each of 19 precast, prestressed concrete roof slabs for the New Kiwanis Youth Center building in Elyria, Ohio. The job of placing the 52-foot-long, 4-foot-wide and 16-inch-deep slabs is handled by a Lorain Moto-Crane. The Concrete Masonry Corp., Elyria, furnished the 10,000-pound slabs.

## Turbopower diesels

■ An illustrated brochure describing General Motors turbopower diesel engines is available from the Detroit Diesel Engine Division of the company. Specifications of the industrial models ranging in brake horsepower from 156 to 300 are fully described, along with features of design and performance data. The 4 and 6-cylinder power plants are said to deliver up to 17 per cent more power than comparable units with no increase in fuel or, conversely, equal power to other units at a fuel savings of 15 per cent.

To obtain Form 6SA40 write to the Detroit Diesel Engine Division of the General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., or use the Request Card that is bound in at page 18. Circle No. 5.

*Visit the Detroit Diesel Engine Division of the General Motors Corp. at the Road Show in the International Amphitheatre, Booth 718.*

## Fuel injection manual

■ An operation and instruction manual for Roosa-Master fuel injection pumps is available from The Hartford Machine Screw Co. The manual is intended to provide sufficient information to permit a mechanic experienced in diesel engines and diesel injection equipment to disassemble, assemble, and to make such adjustments and replacements on Roosa-Master pumps as may be required. Completely illustrated with step-by-step photographs and drawings and exploded-view photographs, the manual includes a section devoted to an explanation of the important components of the pump and their functions.

To obtain this manual write to The Hartford Machine Screw Co., 92 Deerfield Road, Hartford 2, Conn., or use the Request card at page 18. Circle No. 8.

## Durability of concrete subject of HRB bulletin

"Durability of Concrete", a new bulletin from the Highway Research Board, contains two papers presented at the Board's 38th annual meeting in January 1955. The first paper reports on the effect of entrained air on the strength and durability of concrete with various sizes of aggregates. A group of tests provided information about the proper amount of entrained air for adequate frost resistance and the effect of the entrained air on the strength of concrete made with various maximum sizes of aggregate.

The second paper discusses the resistance of concrete surfaces to scaling action of ice-removal agents. The report is a resume of investigations on test materials and procedures for protecting concrete pavements against scaling and disintegration caused by calcium chloride and other thawing agents used for ice removal.

Priced at 90 cents, the bulletin may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

**ARPS TRENCH HOG**
**Digs up to 800′ an Hour At Lower Cost per Foot**

Now you can handle those profitable trenching jobs without a sizeable investment in large, unwieldly equipment! A tractor-mounted Arps Trench Hog will give you big trencher performance and capacity at only a fraction of the cost.

Along with peak capacities up to 800′ per hour, you get unsurpassed mobility — moving from one job to the next at the speed of the tractor itself. The Trench Hog is easy-to-handle — one-man operated for greater economy. Has rugged, all-steel frame; anti-friction bearings; extremely precise hydraulic depth control and independent drive wheel control for accurate straightaway and curved digging; seven digging speeds with depth capacities of 3½′, 5½′ and 7′; quick-change cutters 6″ to 20″ wide; special optional cutters for frozen and rocky soils; boom which raises to approximately 90° angle when traveling.

**ARPS Trench Hog—Best For Any Trenching Job**

- Water Mains
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TRENCHERS • HALF-TRACKS
BULL-DOZERS • UTILITY BLADES

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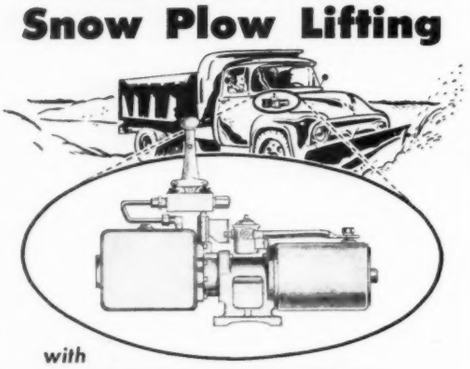
**Snow Plow Lifting**



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**MONARCH DYNA-MIGHT POWER HYDRAULIC CONTROLS**

Fan Belt or Electric models available for practically all makes of trucks. See your dealer or write for full details.

**MONARCH**
ROAD MACHINERY COMPANY
1331 Michigan St., N.E. Grand Rapids 3, Michigan

1856 100 YEARS 1956

For more facts, circle No. 533

*Weldit* **THERMO-DISC SALAMANDERS**

MODEL #800

MODEL #900

Weldit, Inc. presents their new improved line of L-P Salamanders. Featuring the famous "Flame Dome for 360 degree heat and introducing the amazing "Thermo-disc" for extra heat radiation. 100% automatic shut-off on Model #900. Tank top Model #1850 also available.

Canadian Distributor: ALLOY METAL SALES 181 Fleet St., E., Toronto-5, Ontario

Weldit INC. SINCE 1918
990 OAKMAN BLVD. DETROIT 38, MICHIGAN

For more facts, circle No. 534

Monroe's Model 800 adding machine is said to be extremely fast-operating and quiet, and is ruggedly built for field use.

## Full-keyboard calculator operates fast, quietly

■ A new full-keyboard adding machine that is said to be extremely fast-operating and quiet is announced by Monroe Calculating Machine Co., Inc. The Model 800 features single or double spacing and a hinged cover for fast ribbon and paper changes.

Also featured is Monroe's Velvet-Touch keyboard action, cushion-topped keys, and stepped-up keyboard. Colored columns of keys simplify the operator's work.

A triangular symbol automatically prints next to the first item listed, indicating to the operator that the machine is clear and ready for the next listing. The machine is recommended for contractors' payroll departments and for office use. According to the company, its compact, rugged design makes it safely usable in the field.

For further information write to Monroe Calculating Machine Co., Inc., 555 Mitchell St., Orange, N. J., or use the Request Card at page 18. Circle No. 132.

*Visit Monroe Calculating Machine Co., Inc., at the Road Show in the International Amphitheatre, Booths 38 and 39 (Materials and Supply Section).*

## Horizontal earth-borers

■ A 16-page illustrated booklet from the Hydrauger Corp., Ltd., covers the firm's complete new line of horizontal earth-boring equipment. Field operation photographs, including views of embankment drainage and pipeline installations, are included. The Hydrauger design embodies the wet-bore open-hole principle. This principle utilizes hydraulic pressure to keep the cutting edges of the bit cool and clean. The water, after leaving the bit, flushes cuttings from the hole and muds the formation sufficiently to prevent sloughing. Included in the booklet is a complete description of the Hydrauger Model 10-A. The largest in the line, it can cut a distance of 250 feet with a 2½-inch-diameter bore. Reamers up to 24 inches in diameter can be used successfully with the rig in soft to medium-hard formations.

To obtain this booklet write to the Hydrauger Corp., Ltd., 681 Market St., San Francisco, Calif., or use the Request Card at page 18. Circle No. 18.

## Willys names K. S. Moyer

Willys Motors, Inc., of Toledo, Ohio, has announced the appointment of K. S. Moyer as central division manager, succeeding C. W. Grinstead, who has been named director of advertising and merchandising.

## Oil filter spins on and off without tools

■ A new type of oil filter that can be removed and installed without tools is announced by the Wix Corp. The Wix Spin-On is a new and improved version of the PC-15 Full-Flow filter for Ford vehicles.

Many of the 1957 line of Ford vehicles will have the Spin-On filters as original factory equipment; a Wix WF-15 conversion kit with a special adapter is now available to make the new filter suitable for all late-model Ford vehicles with Full-Flow oil filtration systems.

The new filter eliminates the need for filter housings, covers, and cover bolts. It is a disposable cartridge that screws on and off without the use of tools. A built-in relief valve reportedly eliminates the problem of sludge and dirt-clogged permanent valves. A leak-proof seal is assured by a built-in gasket, the company reports.

The Spin-On filter has a spring-loaded valve that retains the sludge and old oil, preventing drain-back. The self-contained, disposable cartridge requires no housing. Made of aluminum, it has a grip-paint surface to facilitate removal and installation.

The new Wix Spin-On PC-15 Full-Flow oil filter with conversion kit. After the old housing has been removed, the gasket, washer, adapter plate, and threaded connector are installed in that order. Then the new filter is screwed into place. Subsequent filter changes require only that the filter be unscrewed, discarded, and a new one screwed on.

For further information write to the Wix Corp., Gastonia, N. C., or use the Request Card at page 18. Circle No. 168.


# FIRST in its Class!

# TRAC-PAVER

## Not just a promise—it's already here—Tested and proven in the field.

**FIRST** medium priced paver with these big machine features:

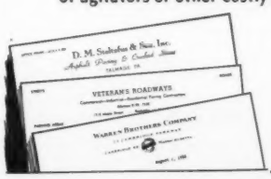
- Self-propelled
- Heated screed
- Crowning device
- Pushes trucks with ease (10 wheelers loaded with 18 tons of material)
- Hydraulic steering
- Hydraulic screed
- 8', 9', 10' paving width
- ½"-5" paving depth
- 5-60 feet per minute paving speed

**FIRST** with these exclusive features:

- 18 m.p.h. over-the-road speed
- 7 ft. turning radius
- Low cost LP Gas screed heater
- Lays any mix to specifications
- Successfully puts down the finest sheet asphalt without the use of agitators or other costly extras.

Paving street for Shuron Optical Co., Geneva, N. Y. (Curtis Paving and Wrecking Co., Contractor)

Parking area for Grand Union Super Market, Troy, N. Y. (N. Y. State Mix 1-A)




**THESE USERS** have proven the versatility of Trac-Paver on both large and small jobs.

**Write or phone for literature, or see your nearest Trac-Paver dealer.**

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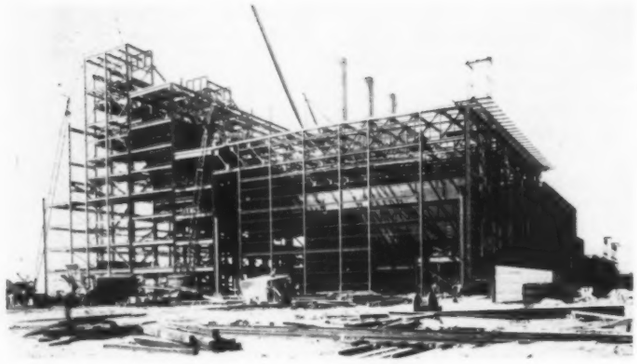
**Phone: HOpkins 8-3360 Dept. C NUNDA, N. Y.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 535



STEEL AND CONCRETE is lifted to the upper stories of the new B. C. Cobb power station being built for Consumers Power Co., Muskegon, Mich., by Lorain cranes. Allied Structural Steel Cos., Chicago, is furnishing and fabricating the steel for the structure.

## Properties of concrete developed in new book

"Composition and Properties of Concrete", by George E. Troxell and Harmer E. Davis, contains information on the control of concrete making and concrete construction, the materials of concrete, and the desirable and undesirable characteristics of concrete.

Part 1 of this two-part book covers the characteristics of cements, aggrates, admixtures, and water used in concrete mixes, the proper proportioning of these materials, and the batching, mixing, placing, and curing of the concrete to produce a finished product of suitable and predictable quality and economy. Several chapters are devoted to the properties of concrete, their significance, and how they are affected by the many steps involved in the fabrication of the product. Data is also included on ordinary concrete, mass concrete, lightweight and heavyweight concrete, and other special concretes.

Instructions for laboratory tests on cement, aggregate, and concrete comprise part 2 of the book. An appendix and index conclude the 434-page book. All data discussed in the book is supplemented by graphs, formulas, charts, and tables. A list of questions appears at the end of each chapter.

The book is priced at $7.75 and may be obtained from the publisher, McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y.

## Spark-ignition engines

■ How to obtain better power economy through the use of spark-ignition engines is the topic of "Lower Power Costs," a booklet available from the Caterpillar Tractor Co. The booklet discusses the recently introduced Cat spark-ignition engines and explains what owners can best profit by their use. A step-by-step explanation of how engine users can determine if spark-ignition engines will be most economical in their territory and on their applications is also in the booklet. In addition, the advantages of the new engines in regard to cost and storage of fuel are also discussed.

To obtain Form No. D643 write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 126.

*Visit the Caterpillar Tractor Co. at the Road Show in the International Amphitheatre, Booths 701, 720.*

## Precast double-tee slabs

■ A bulletin describing a new line of forms for the manufacture of precast concrete double-tee slabs is available from the Irvington Form & Tank Corp. Atlas forms are made in three sizes, each consisting of separate pan, cradle, and bulkhead. According to the company, one cast per day from each form can be depended upon.

To obtain this bulletin write to the Irvington Form & Tank Corp., 20 Vesey St., New York 7, N. Y., or use the Request Card at page 18. Circle No. 67.

## Roebling's appoints two

John E. Heald has been appointed mid-western representative of the Construction Materials Division, John A. Roebling's Sons Corp., Trenton, N. J. He has served as Roebling's south-eastern representative for the past two years. Heald will be situated in the firm's Chicago, Ill., office.

John H. Bass, Jr., who will replace Heald as Roebling's south-eastern representative, will use as his new headquarters the company's Atlanta, Ga., office.


# Ready to roll, closer control!

**delivers 4300 lbs. of 99% dry steam in 30 min. from a cold start**

Displayed at the ROAD SHOW
Chicago International Amphitheater
January 28, 1957

EASY TO START, convenient to operate, quick to service

- For pile driving or extracting concrete, steel or wood piles.
- Provides steam for heating asphalt or ready-mix, winter thawing, cleaning of equipment, heating buildings.
- PS-125 skid-mounted model easily transported job-to-job.
- Costs less to run — has closest control known for pile driving.

# *NEW* Cleaver-Brooks 125-hp PORTABLE STEAMER

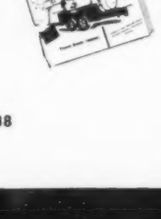
## *easily towed anywhere by truck or tractor*

Wherever you need BIG STEAM CAPACITY—roll in the PSM-125. This self-contained boiler plant on wheels can be dispatched anywhere . . . delivers full output in 30 min. Carries its own fuel supply—132 gals. of No. 2 oil in fender tanks.

With 99% dry steam, single and double acting pile-driving hammers maintain full rating in maximum number of blows per cycle. Rig maintains pressure continuously . . . delivers on demand, in direct proportion to the load. Plenty of reserve capacity for all hammer sizes.

PSM-125 and PS-125 (skid-mounted) units are all-weather protected and glass-fibre insulated. Rugged, welded-frame construction resists impact. Boiler built to same high standards as Cleaver-Brooks industrial boilers, fully fire-tested at the factory.

ONE CONTROL MATCHES FIRE TO THE LOAD — from low to full fire for all steam demands.



*TODAY — write for complete data, including specifications. Ask for copy of catalog AD-159.*

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Cleaver Brooks

PIONEERS OF SELF-CONTAINED BOILERS, PORTABLE STEAMERS, BITUMINOUS BOOSTERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 536

Ten acres of yards and 90,000 square feet of plant area have been acquired by Standard Steel through its purchase of Leader Iron Works. Leader's main manufacturing bay is shown at left. The smaller building in the center is the machine shop, while offices are in the building at the right. ▼

## Hour meters

■ Up-to-date information on the complete line of Hobbs hour meters for direct and alternating current is contained in a bulletin from the company. In addition to picturing the entire line and accessories, the bulletin explains what the meters are, where they are used, how they are installed, and why they are used. Available in pointer-type and direct reading models, Hobbs hour meters record the actual hours and minutes of engine operation for maintenance and utilization purposes.

To obtain the revised Bulletin 535 write to the John W. Hobbs Corp., 226 Yale Blvd., Springfield, Ill., or use the Request Card at page 18. Circle No. 128.

## Standard Steel acquires Leader Iron Works, Inc.

Standard Steel Corp., Los Angeles, Calif., has announced its purchase of Leader Iron Works, Inc., Decatur, Ill. Leader is a steel plate fabricating company.

Standard Steel president Robert S. Burns is now also president of Leader, while Robert R. Johnson, former administrative assistant to Burns, has become vice president and general manager of Leader. E. Donald Peters, former president of Leader, will now act as the company's vice president. The Leader plant will be operated as the Leader Division of the Standard Steel Corp.

## Four new case histories

■ Four new Tractair case histories have been issued by the Le Roi Division of the Westinghouse Air Brake Co. This brings to eight the total of case histories available on the firm's combination tractor-air compressor. The case histories describe the Tractair as used on air application jobs with and without one or more of its many attachments.

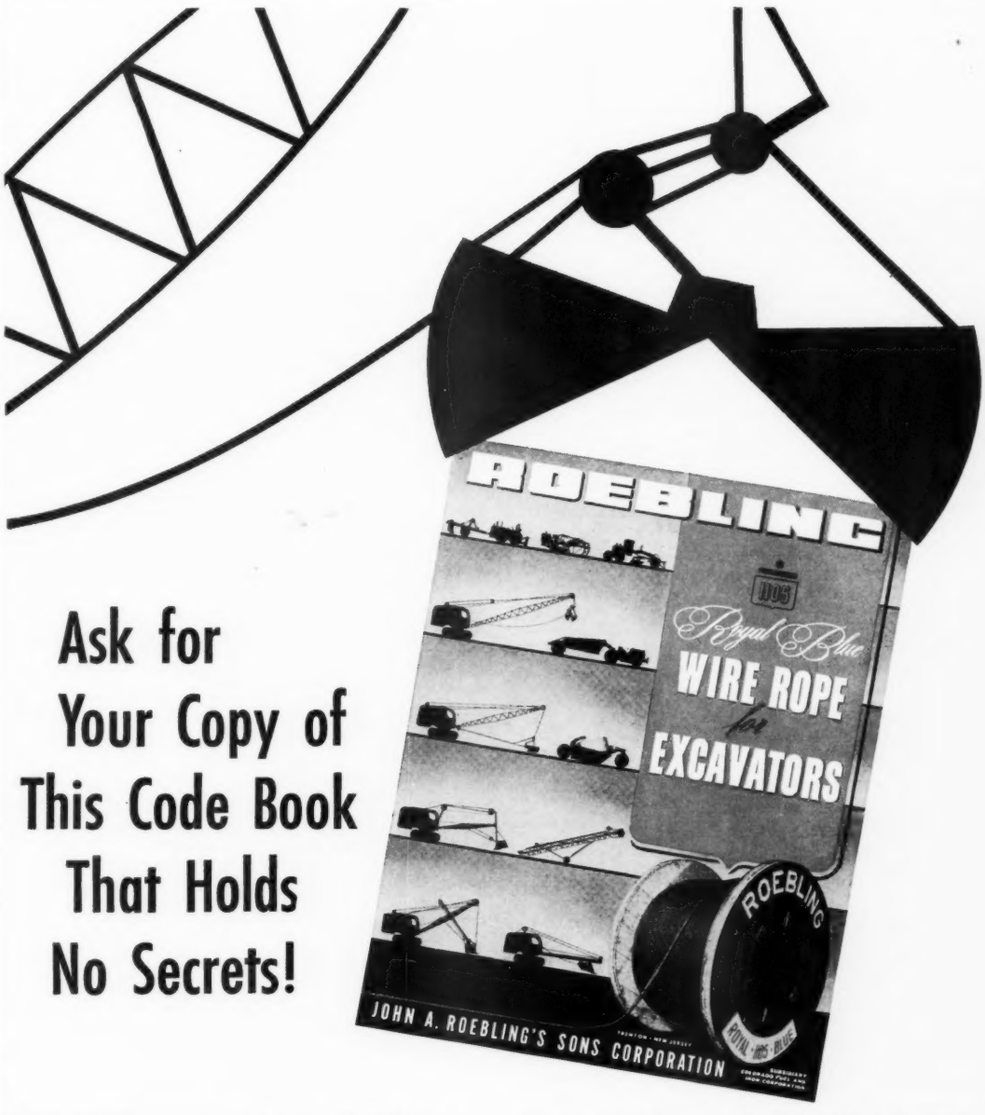
To obtain these case histories write to the Le Roi Division, Westinghouse Air Brake Co., 3716 W. Wisconsin Ave., Milwaukee 1, Wis., or use the Request Card that is bound in at page 18. Circle No. 11.

*Visit the Le Roi Division of the Westinghouse Air Brake Co. at the AED Condex exhibit in the Conrad Hilton Hotel, Booths 53, 54, 55.*

## Handling bulk materials

■ Suggestions on the mechanized handling of construction materials are contained in a booklet from the American Tractor Corp. Job reports and photos show contractors using the crawler-mounted TerraTrac forklift. According to the specifications, the TerraTrac has a capacity of 3,500 pounds with a maximum lift of 21⅓ feet.

To obtain the booklet write to the American Tractor Corp., 800 Fort Wayne St., Churubusco, Ind., or use the Request Card at page 18. Circle No. 173.


Ask for Your Copy of This Code Book That Holds No Secrets!

If you operate excavating equipment, Roebling's new booklet, "Wire Rope for Excavators," is a must. It's chock-full of sound recommendations on where to use Royal Blue Wire Rope—the rope that's built to be stronger than the finest grade previously available.

The easy-to-follow coding system assures that you get the right rope every time. It covers hoist ropes, dragline ropes, ropes for shovels, skimmers, scraper wagons, trench hoes, clamshell cranes, slacklines, derricks, drag scrapers and bulldozers. The recommendations are for the rugged conditions you meet every day.

You'll also find supplementary data on wire rope constructions, diameters, weights and breaking strengths.

There is a copy of this 12-page booklet waiting for you. Communicate with John A. Roebling's Sons Corporation, Trenton 2, New Jersey. Your copy will be sent promptly.

ROEBLING

*Branch Offices in Principal Cities*
*Subsidiary of The Colorado Fuel and Iron Corporation*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 537

## The engineering department

# Excavation and haulage

by GEORGE E. DEATHERAGE, P. E.
construction consultant

Only on excavating jobs involving a small amount of material can the most economical method of operation be selected on a first attempt. Most earthmoving jobs involve a number of factors—varying in importance from job to job—that will affect the cost and the profit of the project. A knowledge of the exact soil characteristics in the job area, as well as job conditions, is a vital necessity in earthwork. A published cost is not worth anything unless the estimator is thoroughly familiar with the material in the area.

Work variables, like transportation to the site, clearing, volume changes, drainage, haul roads, grades, fill specifications, and many other elements must be taken into account by process charts, which reveal the most economical way of handling the material. Follow each cubic yard of earth from its point of excavation to its final deposit, so that backfill and haulage of surplus dirt is automatically figured into the chart.

### Volume change, moisture

One of the first items to be considered when trying to determine whether hand or machine methods are to be used is the volume of earth on a job. A trenching machine, for instance, might do all the trench work for a building in a single shift. The cost of transporting the machine—a cost that seems excessive—may be outweighed by the high output of the machine. An important consideration here is whether or not the contractor has his own equipment to use for the work. If he has, he will most likely use the machine method.

Changes in volume will vary with the classification of the material, being less in sand and increasing greatly with blasted rock. In general, soils are classified as either sand, gravel, shale, loose rock, clay, mud, and solid rock, with mixtures of all but the latter. With the exception of sand, it is safe to assume about one-quarter increase in volume in a wheelbarrow or truck when the material has to be transported or handled as backfill.

Moisture in just the right amount will give some soils lubricating qualities, making them easy to handle with a shovel or scraper. Too much moisture will create a sticky mass that is difficult and expensive to handle. The site should always be investigated for drainage conditions, springs, or bogs that will make excavation and transportation difficult. Allowance must also be made for doing this class of work in areas of excessive rainfall. In these areas, allowance for temporary roads and maintenance must be increased.

Test drillings and core borings must be watched carefully and the level of the water table ascertained to make certain that additional costs are included in the estimate should the excavation go below this point.

Clay which is damp and plastic will weigh nearly twice as much as clay in dry lumps. The water content of damp clay will proportionally cut down on the amount of material that can be handled by trucks.

Equivalent fuel pressures and angles of repose for various materials


# Now-GMC's new tandem Mo

## —with more power—more "muscles"— more earning capacity— for every construction use

Now the wraps are off these great new GMC super-trucks—destined to hike the profits of haulers in every kind of construction work.

There's new, cost-shrinking power right down the line. A 220-h.p. Six delivering tremendous torque. Two new short-stroke V8's at 206 h.p. and 232 h.p.

There's a sensational new Turbo-power Diesel. Its 2-cycle design gains most from turbo-charging—taking as much as 11 horsepower right out of the air—from otherwise wasted exhaust flow!

And that's not all. New axle and spring options* equip these haulers to handle bigger jobs.

There are bigger, surer brakes, too. In fact, these GMC's are engineered—from rims to roof—to snap through bigger, tougher jobs—with less time out for repairs. So there are far lower maintenance costs—far lower operating expense in every department.

And many models now offer a front engine PTO drive option*—eliminating all need for an auxiliary engine for transit-mix work.

Add it all up and it's easy to see why these great new GMC tandems are called Money-Makers. They blanket the 28,000 GVW-90,000 GCW range. And your GMC dealer has the story on every one of them!

*Optional at extra cost

GMC TRUCK & COACH—*A General Motors Division*

**New turbo-charged six-cylinder 2-cycle Diesel** that delivers more power on less fuel.

**New high economy V8's with 20 and 232 h.p.** A new 220-h.p. delivering tremendous torque.

**New axle** permit big

may be secured from most civil engineering handbooks. Repose angles should be checked when considering bank sloping.

### Hand excavation

Single-lift hand excavation will vary with the job conditions and the nature and condition of soils. Most published costs do not specify the type of soil handled on a particular job, and therefore, they are dangerous to use. It is safe for the estimator to assume that an average man cannot excavate more than 4 cubic yards from a trench no more than shoulder high. Production should double in sand or loam, but be reduced some 25 per cent in heavy clay or soil. The output per shift in shale, hard dry clay, and hardpan or soft rock will be reduced more than 25 per cent.

It is safe to assume that an average laborer, without overworking, is capable of digging and casting one cubic yard of earth per hour in ordinary soil for trenches and piers not over 5 feet 6 inches deep. This figure is an average; it will vary depending on the type of the ground and the efficiency of the men. On the same job, these same production rates apply to loading material into trucks.

In piers and trenches up to 12 feet in depth, requiring two lifts to throw the dirt to the surface, the production per man will be lowered 25 per cent over that for a single lift.

The current production rate for loading medium clay or earth, wheeling it 50 feet, and dumping it, will not exceed one-half hour per cubic yard, and this rate can be increased a third when work is done with sand or loam. An average man should backfill an average of 16 cubic yards per 8-hour day. Tamping will cut this production rate in half.

The current production for spreading loose soil by hand is 30 cubic yards per 8-hour shift. This does not include transporting the material. Rock that will require blasting is generally priced at from $5.00 to $10.00 a yard, depending on the volume, job conditions, and the character of the rock. Valuable data on this subject can be secured from the 13th edition of "The Blasters Handbook", published by E. I. Du Pont de Nemours Co., Wilmington 98, Del. It is preferable to take subcontract prices on the removal of a great quantity of rock, as this requires special permits, licenses, equipment, and personnel.

*This is the thirteenth of a series of articles on Construction Management by George E. Deatherage, P. E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.*

### Machine excavation

If a high lift tractor shovel is working in ordinary soil and loading into trucks, the output to be expected is from 150 to 200 yards per shift. The crawler-mounted rigs, however, are forbidden on city streets, and the units will have to be placed on a trailer truck to be transported to the work site.

Since both rubber and crawler-mounted tractor shovels are not suited for digging in hard soils, the estimator should depend on them only when excavation is to be done in soft or loose soils. Factors affecting hand excavation costs must also be taken into account when machine methods are used.

The cost per yard excavated will again greatly depend on such things as the volume of earth in the job and the cost of transportation to and from the work site. Even on a well organized job, figure the machine as working productively 50 minutes out of the hour, or at 83 per cent efficiency. Though power shovels have a greater capacity, their efficiency is even lower, since empty trucks cannot be kept under them at all times.

A crawler-mounted bulldozer is one of the most effective and economical pieces of equipment for a contractor to own. If the bulldozer works in a limited range, it can move dirt very cheaply and, with the many available attachments for it, the bulldozer can be used on a variety of work. Tractor dozers are economical in pushing dirt up to 200 feet. When this distance is exceeded, some other type of equipment will be required. The rubber-tire dozer, being more maneuverable with its high forward and reverse speeds, can economically work up to 400 feet. The output will be from 200 to 400 yards per day, depending on the soil classification, the depth of cut, and the length of the push.

When a contractor moves into the heavy equipment field, he usually is a specialist in highways, dams, and


em Money-Makers for '57

**New Hydraulic fans on Diesel models** that operate only when needed—and save up to 10 h.p. and 5% on fuel.

**New full-length frame reinforcements** —for liquid loads and other severe service —are a new option that gives these GMC's tremendous stamina.

**New axle and spring options** that permit bigger payload values.

**New optional front engine Power Take-off** to handle transit mixers without auxiliary power.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 538

other heavy construction work. In this case, he should be able to keep his heavy equipment busy at least eight months of the year; otherwise his investment is generally not economical. The average general contractor will do better to sublet his heavy excavating to these specialists, as he cannot keep equipment busy enough to make the rigs pay their way. Assuming that machine operation is practical, the general contractor cannot come up with alternative methods of excavating that are cheaper than the subcontract price.

For instance, at 100 per cent efficiency, the rated output of a 1-cubic-yard gasoline powered shovel will be about 180 cubic yards an hour in medium clay soils. Work efficiency will rarely be more than 75 per cent of the rated capacity, and on work of small volume it will drop to 50 per cent.

In considering the shovel output, the estimator will have to assume the shovel efficiency under the conditions being estimated in order to calculate the hourly output. Rental rates and ownership costs will supply the estimator with the hourly operating cost and, by establishing an assumed percentage of efficiency, he can arrive at a cost per yard at the dipper. The top rated capacity of a shovel working in medium clay soils will have to be reduced when the rig is working in hardpan, soft rock, and other difficult soils.

The balance of the yardage price, from the shovel dipper to disposal, is a matter of haulage, which should be separately calculated, then added to the dipper price.

The final assumed cost tabulation will include the prices for hauling the shovel to the job and setting it up, ownership or rental costs, operating costs—including labor—and fuel—cartage and removal costs, yardage capacity per shift at 100 per cent efficiency, deductions for the usual operating delays, and deductions for handling difficult soils.

### "Off highway" haulage

In estimating costs for transporting excavated material, the estimator should distinguish between "off highway" and "on highway" haulage.

"Off highway" hauling, which does not require streets or roads, is most typical on highway and airport grading jobs. Self-loading equipment such as the various types of scraper loaders—are most commonly used on this work, along with tractor tread and wheel vehicles of a large capacity that are loaded by power shovels. These haul units—most of them diesel powered—operate under a much higher wheel and axle load than is permitted on streets and roads.

"On highway" hauling is done by gas or diesel operated multi-wheel trucks mounted on rubber. These rarely exceed a 10-yard capacity, for the wheel and axle loads must not exceed limits imposed by law. This type of haulage is more expensive than "off highway" haulage because the equipment used has less capacity, traffic problems on roads may cause numerous delays, and distances to the dump site are usually greater than on jobs using "off highway" rigs.

Though "off highway" equipment is highly desirable for use on jobs where hauling equipment does not have to take to the roads, its use may not always be practical or economical. If, for instance, the amount of material to be excavated and moved is very small, the contractor will not be warranted in bringing in the heavier equipment.

When estimating the haulage cost per cubic yard of material with "off highway" equipment, the first thing to do is to estimate the hourly ownership cost, and the hourly operating cost. A standard procedure is to base the figures on 2,000 operating hours per year.

In estimating ownership costs of a piece of equipment costing $30,130, add the cost of extras and freight to the original cost to bring the total cost to $30,820, then deduct the original value of tires to arrive at the total cost to be depreciated. If this figure comes to $26,056, dividing it by a depreciating period of 10,000 hours would give a cost of $2.60. Interest, taxes, insurance, and storage costs, estimated at 10 per cent of the average yearly investment, is then added to this price. If the average yearly investment for five years is 60 per cent of the delivered price—($30,820 x 60 per cent) divide this figure by the 2,000 hours of annual equipment operation to get the yearly investment. Ten per cent of the yearly investment will give an additional hourly ownership cost of 92 cents. This, added to the $2.60 depreciation cost per hour, shows that the equipment will have a total hourly ownership cost of $3.52 throughout its depreciation period of five years.

Operating costs take into account the cost of tires, repairs, fuel, and the salary of the operator. The hourly operating cost of this rig, added to the hourly ownership cost, will give


LIMA

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Here are two powerful additions to the LIMA line of power shovels, cranes, draglines and pullshovels. The Types 1250 and the 1250-SC are the carefully engineered answers to the popular demand for a high capacity shovel and a crane that will hoist concrete and steel to the top of a 24-story building.

As a standard shovel, the 1250 is equipped with a 28-foot boom, 22-foot handle and three cubic yard dipper; as a high lift shovel, with a 45-foot boom, 32-foot handle and 2½ cubic yard dipper.

The 1250-SC is designed for sky-scraping duty, a rugged machine that swings a 200-foot boom and 50-foot jib with pin point precision.

These air operated rigs are in the big-time producer class yet their design permits knock down for haulage into units of less than 60,000 pounds. Side frames and counterweight segments are removable and the gantry can be folded to a height of 12 feet, 7¼ inches for job to job transportation.

Two truck bases are available—standard and widespread as well as two lengths of crawler assemblies (standard and long). The bases are one-piece carbon steel castings, bored and bushed for through axles.

The 1250 and 1250-SC are available with diesel or electric power and with or without torque converter drive.

Get complete details on this profit-making machine from your nearby LIMA distributor, or write to Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

| BRIEF SPECIFICATIONS | Shovel | Dragline | 1250 Crane | 1250-SC Crane |
|---|---|---|---|---|
| Rating | 3 yds. | ..... | 85 tons | 100 tons |
| Crawler length | 16'-5" | 20'-7½" | 20'-7½" | 20'-7½" |
| Crawler width (32-in. treads) | 13'-5" | 13'-5" | 13'-5" | 16'-0" |
| (42-in. treads) | 14'-3" | 14'-3" | 14'-3" | 16'-10" |
| Cab width | 10'-6" | 10'-6" | 10'-6" | 10'-6" |
| Cab height | 12'-7¼" | 12'-9¼" | 12'-9¼" | 12'-9¼" |
| Rear end tail swing | 15'-8" | 15'-8" & 17'-1" | 15'-8" & 17'-1" | 17'-1" |
| Gantry height (folded) | 14'-1¼" | 14'-3¼" | 14'-3¼" | 14'-3¼" |
| Gantry height (working) | 14'-1¼" | 23'-10" | 22'-1" | 22'-1" & 28'-9" |
| Boom length | 28' & 45' | 110' | 60' to 150' | 100' to 200' |
| Handle length | 22'-9½" & 32'-9¼" | ..... | ..... | ..... |
| Jib length | ..... | ..... | 20' to 50' | 30' to 50' |
| Boom length, including jib | ..... | ..... | 200' | 250' |

**COMPARE LIMA QUALITY** . . . features and available equipment:

- *Independent propel*
- *Load-lowering device*
- *Extra high-speed hoist attachment*
- *Third drum*
- *Power-reversing hoist drum*
- *Heavy-duty and special lightweight booms*
- *Telescopic boom stop with automatic shutoff*
- *Steering controlled by gear-type jaw clutches*
- *Electric lighting equipment*
- *Torque converter drive*
- *Anti-friction bearings at all important bearing points*

**QUALITY CONSTRUCTION**

One-piece carbon steel rotating truck base . . . fabricated steel machinery frames . . . machine-cut gears . . . heat-treated steel ground shafting . . . large diameter clutches and brakes.

**THE LIMA LINE INCLUDES:**

| SHOVELS | CRANES | DRAGLINES | PULLSHOVELS |
|---|---|---|---|
| to 6 cu. yds. | to 110 tons | variable | ½ to 2½ cu. yds. |

*Smaller machines available on rubber*

**SEE THE NEW LIMA 1250 AT THE ROAD SHOW, BOOTH 506 ARENA IN CHICAGO, JAN. 28—FEB. 2.**

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the total estimated hourly ownership and operating costs. In figuring the hourly cost of tires, take the original $4,764 cost of the tires, and divide this figure by the 3,000 hours of estimated tire life. This gives an hourly tire replacement cost of $1.59. Tire repairs can be estimated at 15 per cent of the hourly tire cost, or 20 cents. Repairs, including parts and labor, fuel, oil, grease, and the salary of the operator would, in this case, bring the total hourly operating cost to $5.41. This figure, added to the hourly ownership cost, gives a total estimated hourly ownership and operating cost of $8.63.

**Yardage Production**

Hourly production of a unit will depend on the capacity of the rig, time lost in loading, time spent at the dump, the nature of the terrain, and the efficiency of such rigs as tractors or shovels that are used as aids in loading the haul units. The length of haul and the time required for a round trip will have to be calculated separately.

A rule of thumb method of calculating the hourly capacity of a power shovel is from 100 to 125 times the dipper capacity. The safest method in estimating the hourly capacity of a haul unit is to make a process chart of the operation. Also useful, however, is data on the cubic yardage that equipment can haul for varying distances, which is tabulated and made available to contractors by manufacturers of haul units.

**"On highway" trucks**

The ownership and operating costs for "on highway" trucks can be figured much the same as for "off highway" trucks, though costs will vary in different localities. Hourly rental rates and hourly pay rates for drivers will also vary in different sections of the country. All this will have to be taken into account in figuring the hourly operating cost.

If the "on highway" trucks are to be loaded at the work site by a power shovel, the estimator may assume a 3-minute loading period at the shovel and a 5-minute dumping period. Allowance will have to be made for swell, and this will require the trucks to haul from 15 to 25 per cent more earth than is included in the amount to be moved.

The total number of loads hauled per shift will depend on the haul distance and traffic conditions on the roads. The only safe way to figure the time required for hauling is to go over the route at the speeds the haul truck will travel and record the time needed to make the trip. Several alternate routes may be tested before selecting the one that enables the trucks to make the best time.

Hand loading of a truck will run the cost of the operation up tremendously—higher than most estimators usually realize. A maximum of six laborers can load a truck; more men around the vehicle will only get in each other's way. While they load the truck, the vehicle runs up waiting time. The cost of haulage to the dump and the return trip makes this type of operation prohibitive in many cases.

**Scrapers, trenchers, clamshells**

Scraper-loader grading operations, with rigs of up to 30-cubic-yard capacity, are being done with such highly specialized techniques that the factors affecting production are numerous and variable. Many angles of this operation are covered in "Earthmoving—An Art and Science" by Dan K. Heiple, chief engineer of R. G. LeTourneau, Inc., Longview, Texas.

Where soil and conditions are favorable, the trenching machine will produce more pay yardage than any other type of excavator. It can complete from 100 to 300 linear feet of trench per shift, depending on the width and depth of the trench being dug. When the job is large enough, and there is enough room for the rig to operate, the machine is the best choice for any one estimating trench work. In most localities, subbids can be secured on a large volume of such work.

A clamshell bucket used by a crane is not an efficient yardage mover, but it is an indispensable piece of equipment in a number of cases, for caissons and other areas inaccessible to other types of excavators can be excavated easily by clamshells. Only in rare instances will the soil be of such a nature that a clamshell bucket cannot pick up a full load.

Since production will vary with the nature of the work, estimating the amount of work a clamshell will do on a job will require a process chart. In estimating production, cut the rated bucket capacity by half and make the usual allowances for such things as cartage, setup time, dismantling, and transportation.

A comprehensive survey on the operation of cranes, draglines, and clamshells has been compiled by E. O. Martinson, vice president of Koehring Co. A companion study by the same

*(Concluded on next page)*


TYPES 1250 *and* 1250-SC

3 CU. YD. HEAVY-DUTY SHOVEL

HIGH-CAPACITY DRAGLINE

85 TON CRANE AT 13′ RADIUS

100 TON CAPACITY ON 60′ BOOM AT 13′ RADIUS

18 TON CAPACITY ON 200′ BOOM AT 50′ RADIUS

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The dragline is useful mostly on jobs where the machine can remain on a bank while it swings the bucket over the work. Yardage capacity will be roughly the same as for a power shovel—100 to 125 times the bucket capacity per hour. In hard soil, this figure will have to be lowered.

The large-capacity walking draglines are specialized equipment, designed for work in swampy ground that is encountered mostly in the construction of such facilities as levees and earth dams. They are economical to use only on work requiring a large volume of material to be excavated.

Cableway excavation is efficient and economical when a contractor has to produce sand and gravel or excavate in a borrow pit. This machine will seldom be moved during such excavation. Spans of 1,000 feet or more are common, and the bucket, which can dump automatically at any spot along the cableway span, is capable of handling from 30 to 60 loads per hour. It is generally classified as specialized equipment, and unlike most other excavators, is not usually rented.

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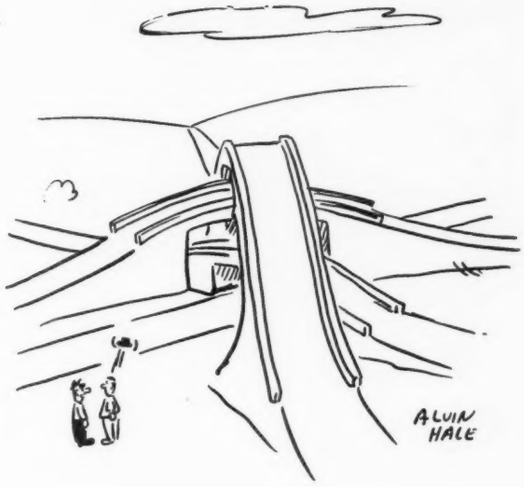


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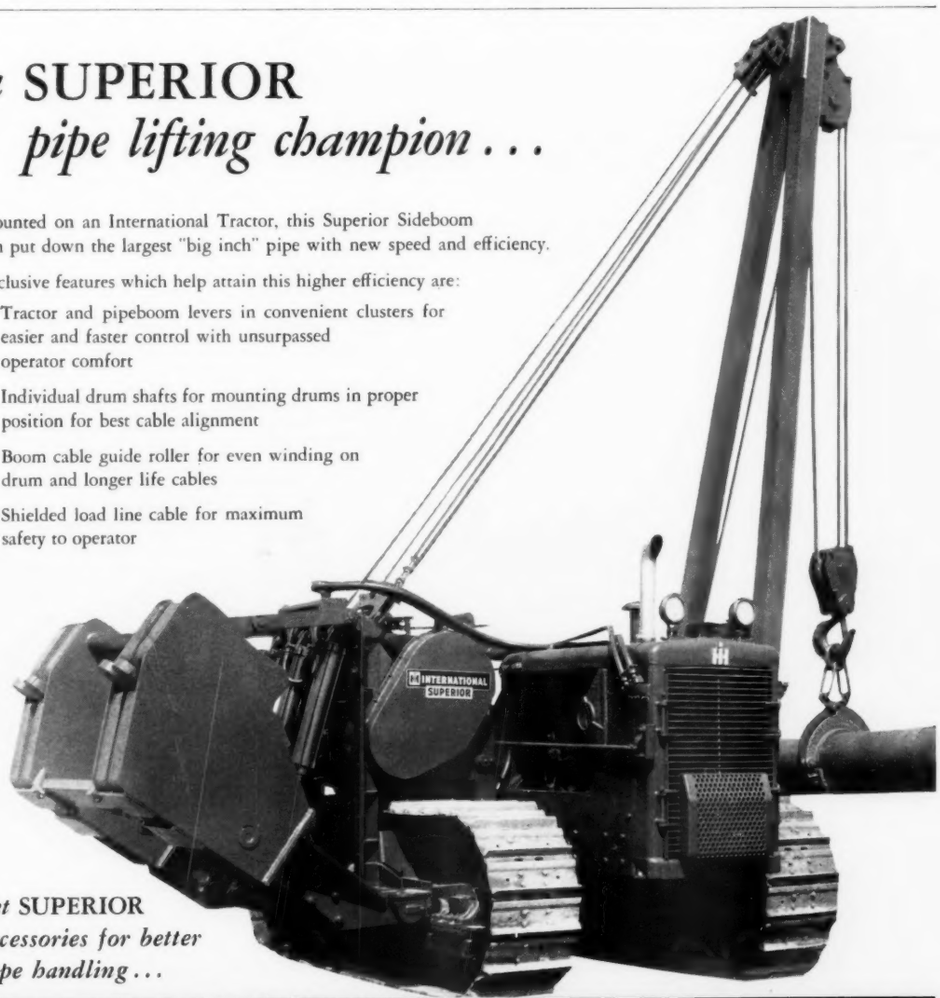


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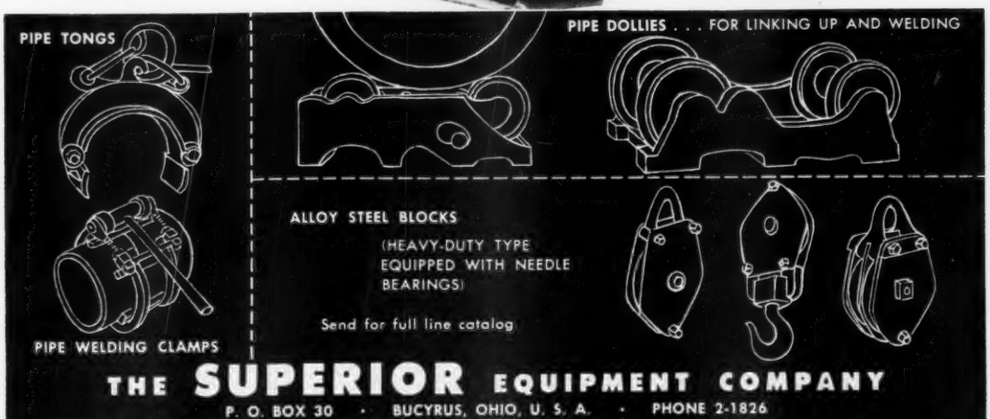
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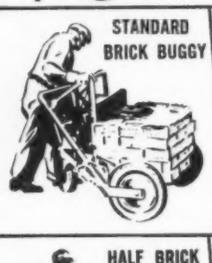

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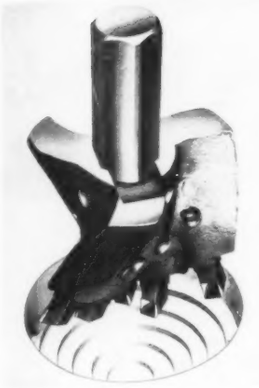

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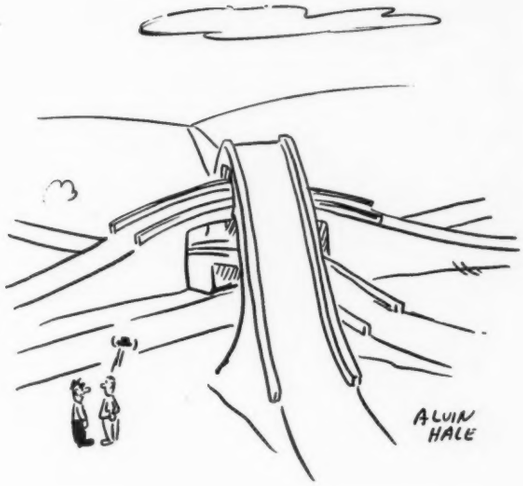


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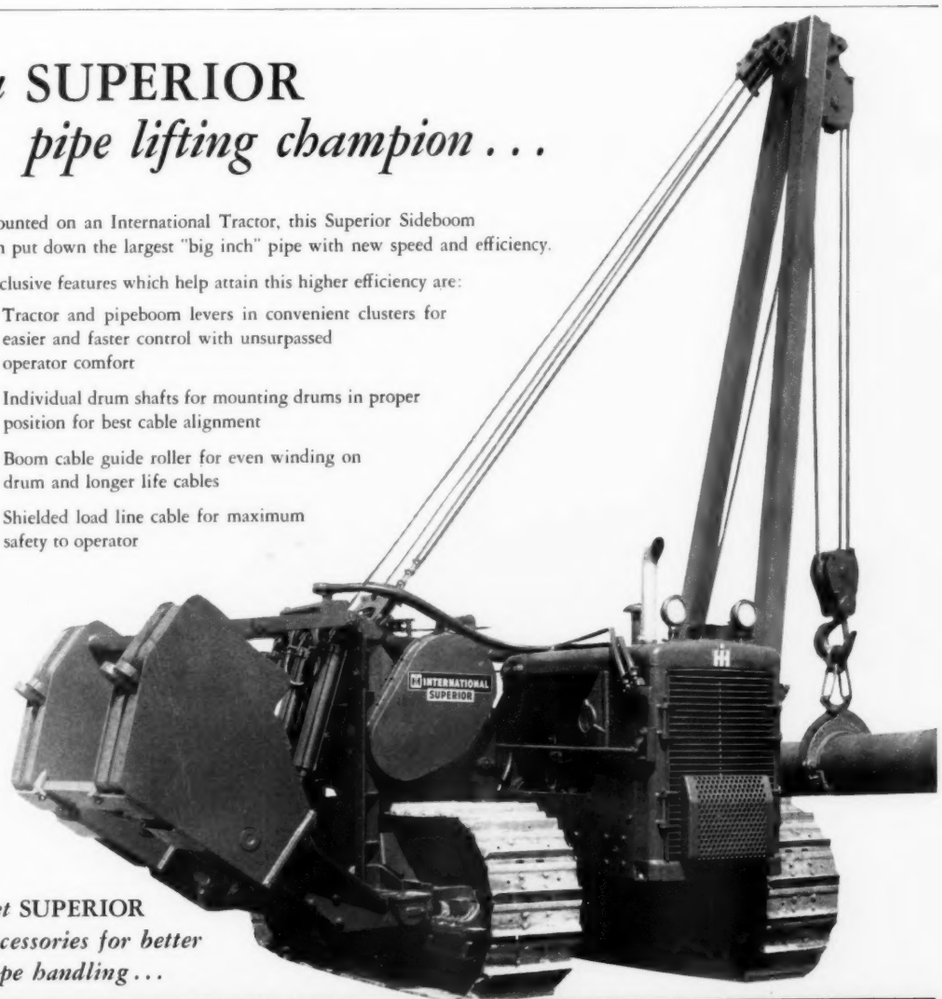


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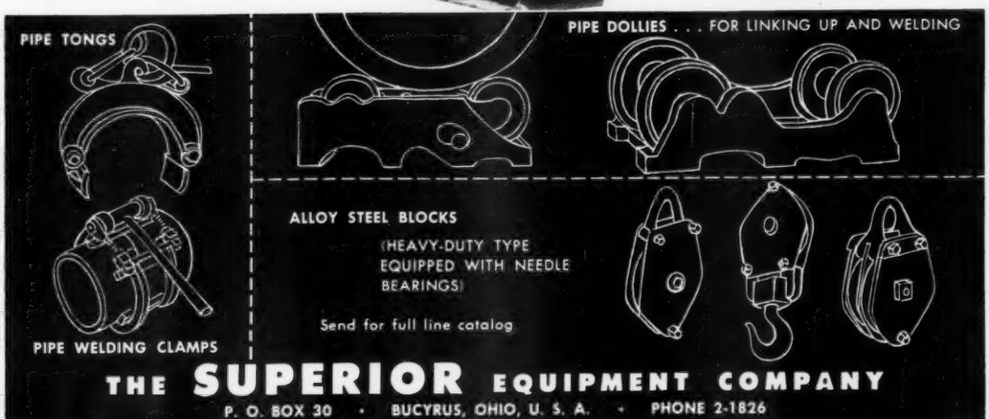
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Roadway side ditches that will handle runoff—formed as fill material was excavated for the road—outline the grade of the dual-lane pike at the Jupiter interchange. An excavation also formed the artificial lake at the interchange.

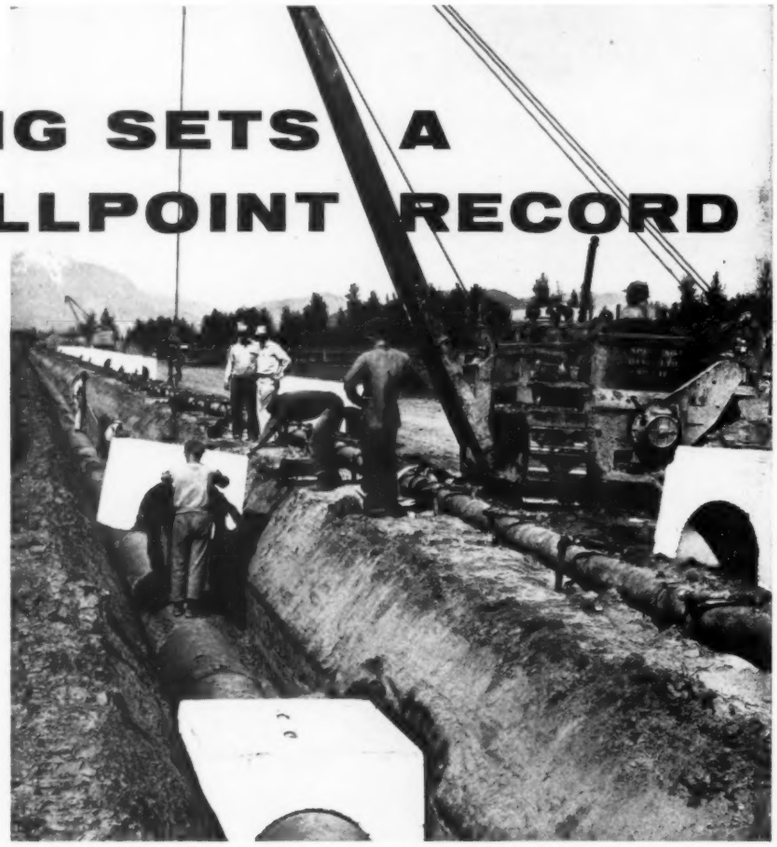
# Similar grading methods prevail on Sunsh

Though work on the Miami-Fort Pierce section of the Sunshine State Parkway was similar for the length of the 108-mile stretch, contractors—as is usually the case—went about their jobs differently on the route to achieve identical results.

The soil and the geological makeup of southern Florida is so uniform that the grading and drainage operations of the many contractors working on small sections of the road were basically similar. The grading contracts, calling for the subgrade to be brought up to designed grade elevation, were let by the Florida State Turnpike Authority before a separate set for the roadbed and base course, and a third set, for paving, were awarded.

Typifying the slight difference in grading methods were the 4.8-mile stretch and the 5.8-mile stretch completed by Hooper Construction Co., Inc., Miami, Fla., and Ralph E. Mills Co., Frankfort, Ky. Different spreads of equipment to complete portions of the work, and variations in grading, due to the design of the road, were


STANG SETS A WELLPOINT RECORD



*Note shovel marks next to concrete weight in foreground of photo. This clearly indicates how well the earth is stabilized—no sloughing—no extra hand work required.*

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This 150 miles of 30-inch natural gas pipeline through southern British Columbia is being laid for the Pacific Northwest Pipeline Corporation by Sparling-Davis Co., Ltd. of Canada. In order to complete the 24 miles of dewatering required on the job within approximately 60 working days Stang field engineers contemplate stepping up the working schedule sufficiently to end up with a 2000 foot daily pipeline installation average for the entire job. Don't slow down your production because of groundwater—use Stang Wellpoints and engineering services to protect your job profits!

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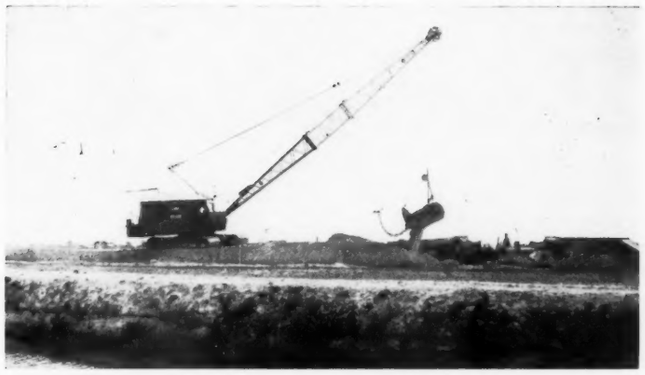
# Sunshine State Turnpike sections

***Borrow pits lacking in flat coastal area of Florida; fill is obtained from canals, roadway side ditches***



Fill for the short stretch graded by Hooper Construction Co. is obtained from a canal by a Lima 750 with 60-foot boom and Hendrix 2½ yard dragline bucket.

the main differences between these jobs.

The shorter stretch, handled by Hooper under a low-bid contract of $531,891, consisted of fill work. No cuts were required. Hooper moved in with a large fleet of earthmoving equipment to place more than one million cubic yards of embankment.

Since this eastern coastal area of Florida is an almost flat marl and limestone shelf, covered with a layer of sand and muck that varies in thickness, Hooper—like most of the other grading contractors on the road—was unable to set up a borrow pit to obtain the required fill. Most of the borrow was secured from ditches cut along the turnpike right-of-way. The ditches made by excavating fill for the roadway will serve as large roadway side ditches to handle run-off. Such large ditches would have been required in any case, since the usual size of roadway ditches would not be able to handle the large amount of rainfall that occurs during

(*Continued on next page*)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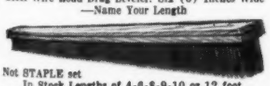

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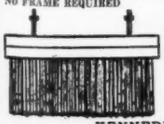

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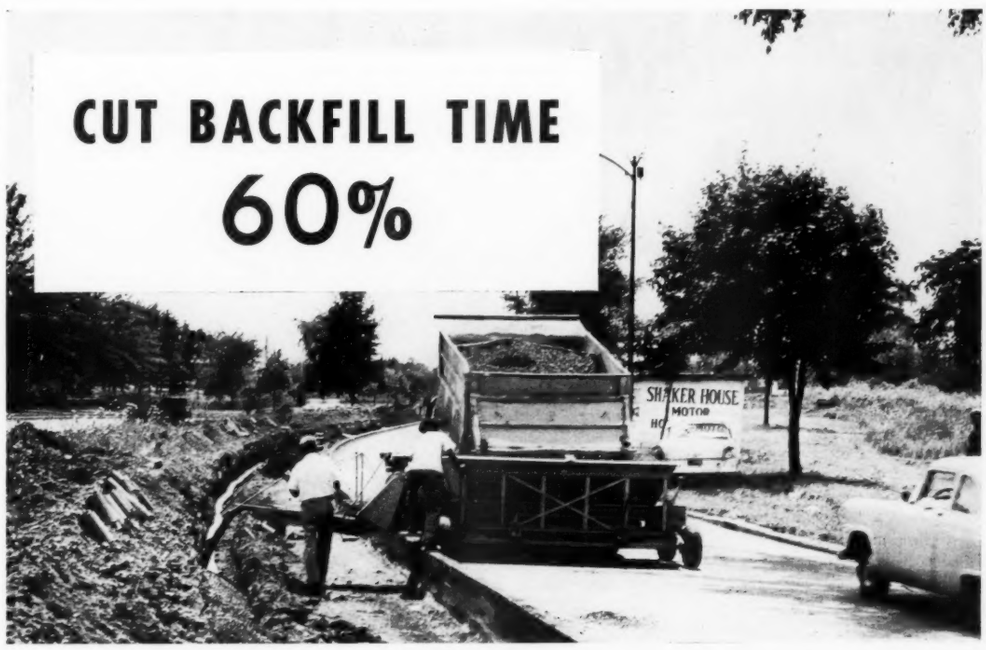


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(Continued from preceding page)

a concentrated period of time in this section of Florida. The fill excavation and the ditch excavation operations were both done as one job.

#### Equipment fleet

Hooper used three draglines—a Bucyrus-Erie 38-B with 70-foot boom and a Hendrix 2½-yard dragline bucket; a Lima 1201 with 90-foot boom and Hendrix 4-yard drag; and a Bucyrus-Erie 54-B with an 80-foot boom and Hendrix 4-yard drag bucket—to cut the ditches to a 34-foot width and 6-foot depth. Another rig, a Lima 750 with 70-foot boom and Hendrix 2½-yard dragline bucket, was used to remove more than 150,000 cubic yards of fill material from an existing drainage canal that cut across the right-of-way. This material was used to build up the grade for the McArthur Interchange, which will serve Fort Lauderdale.

Hauled from the canal by a Euclid bottom-dump, the fill is deposited on the roadway to be rough-graded by a Cat tractor-dozer. Hooper obtained other fill from 34-foot-wide 6-foot-deep roadside ditches, which will be used for runoff.

Five Euclid 17-yard bottom-dumps together with six scrapers were used to haul material directly from the draglines to the various fills. The Euclids were loaded by draglines, while three Caterpillar DW21 scrapers, and three other Cat scrapers pulled by Cat D8 tractors, loaded from material that was stockpiled by the draglines. Two D6's, two D7's, and five D8's were used to push and pull scrapers picking up loads and to do rough grading as the borrow material was placed.

The highest fill on Hooper's stretch was the one measuring 22 feet, which was located at the interchange that will tie into an existing road being carried over the turnpike.

#### Similar operations

A few miles north of the Hooper spread, similar earthmoving operations were carried on by Ralph E. Mills Co., Frankfort, Ky., which completed grading and drainage work on

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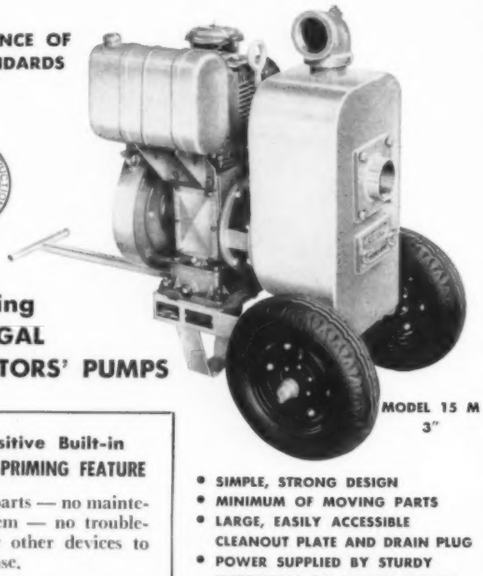

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a 5.8-mile section. This $800,000 contract, for the area just west of Pompano Beach, differs from Hooper's in that different facilities had to be built. This job called for more than 1,100,000 cubic yards of roadway embankment to be placed, about 30,000 cubic yards of muck to be removed, construction of a few structures that will carry the turnpike over and under existing drainage canals and roads, and the grading of one of the turnpike's service areas.

About 375,000 cubic yards of fill was obtained from Pompano Canal, a 40-foot-wide 6-foot-deep waterway. This canal was widened to 100 feet and cut to a depth of 15 feet as fill was excavated and stockpiled along the right-of-way. The remaining amount of fill was obtained from roadside ditches, which are 34 feet wide and 6 feet deep.

About 100,000 cubic yards of fill was required for the service area. Located on a widened median, this area will serve both north and southbound lanes, eliminating the need for twin facilities, one on each roadway. The roadways had to be separated for a length of over 4,000 feet to make room for the service area and acceleration and deceleration lanes on both roadways.

Four draglines, equipped with Hendrix 3-yard buckets, removed fill from the canal, cut side ditches to obtain additional fill, and removed muck from the proposed roadway. Material excavated from the canal and side ditches was transferred directly to ten Euclid 15-yard bottom-dumps that hauled to fill areas.

The draglines also stockpiled material along the canal and ditches to be picked up by scraper units. These included three Caterpillar DW21's and two Cat 15-yard scrapers pulled by an International TD-24 and a D8.

Two tractors, both Allis-Chalmers HD-20's, push-loaded the scrapers to capacity. They also pushed the loaded Euclid bottom-dumps, which tended to get stuck in this highly sandy material along the right-of-way.

Part of the equipment fleet consisted of four International TD-24 tractor-dozers that were used on the roadway fills and on top of the stockpiles. The dozers shaped the stockpiles, allowing scrapers to ride up to the top and pick up a load. The TD-24's also pushed stockpile material down from the top to allow other scraper units to load alongside the bottom of the stockpiles.

Along Pompano Canal two draglines were used, one to load the bottom-dumps and a second to stockpile material. The other draglines were busy cutting roadway ditches and removing muck.

Compaction of the fills was handled by two Bros 25-ton rubber-tire rollers, one self-propelled and the other tractor-drawn.

### Clearing and grubbing

Disposing of palm trees cut down during clearing operations was a problem on the Mills spread. A Caterpillar D8 tractor with a raker attachment was used for normal grubbing, but the tall 18-inch-diameter palm trees had to be cut. After clearing, Mills found that burning the palm trees—which have a fibrous makeup and a high water content—was a time-consuming and not a very efficient way to get rid of them. The contractor finally had to bury the trees along the right-of-way, and this meant that they had to be moved to spots where the right-of-way was wide enough to take the trees. Hooper did not come up against this problem at all, since its 300-foot-wide right-of-way strip ran through relatively open country.

This Cat DW21 scraper, which has picked up fill stockpiled by one of Hooper's draglines, spreads the material near the McArthur Interchange that will serve Fort Lauderdale. This 22-foot fill was the highest in the section.

### General design features

Some of the design characteristics on this $65,700,000 stretch, which will eventually be extended northward to Jacksonville, incorporate features from many toll roads already built or under construction throughout the country. The design of the road provides for vehicle speeds up to 70 mph, making the road comply with the requirements of the National System of Interstate Highways.

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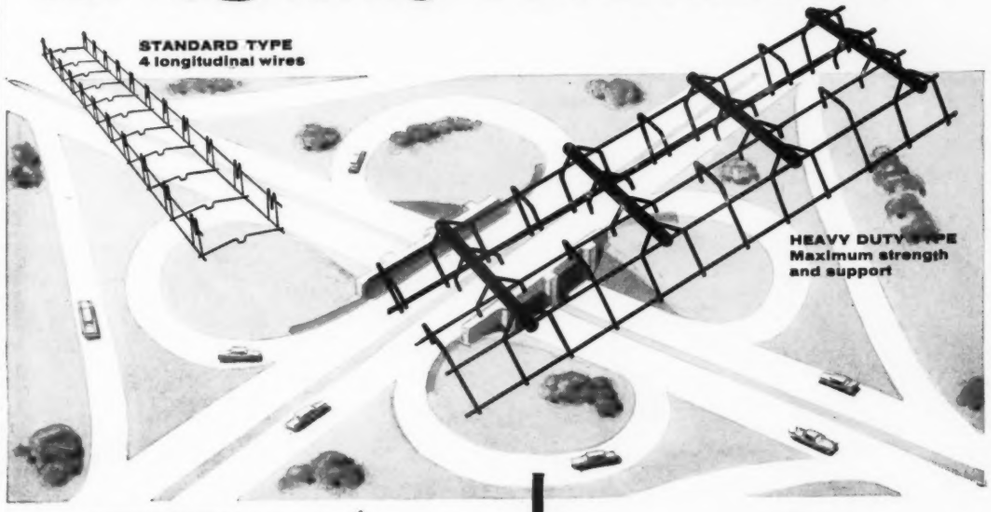
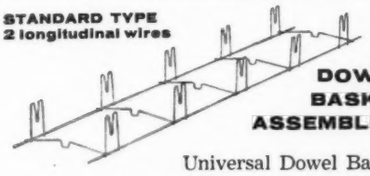



STANDARD TYPE
2 longitudinal wires



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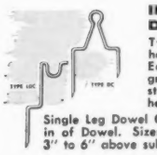

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**for: bridges, highways, airport runways, dams, culvert, floors, walls.**

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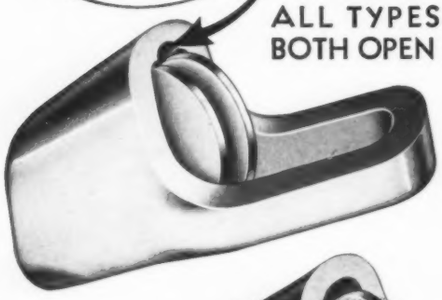

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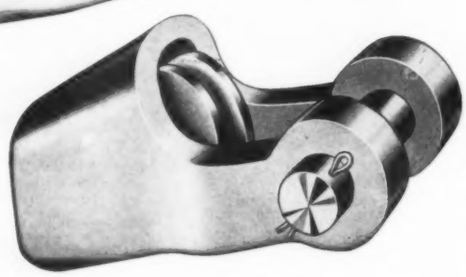

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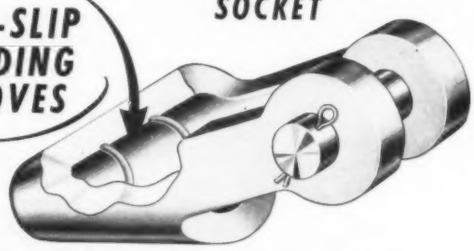

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Dirt spills down the slope of the overpass embankment being built by a Cat D8. Blythe Bros., Inc., Charlotte, N. C., is the grading subcontractor on this 7.7-mile stretch of the pike.

*(Continued from preceding page)*

two 24-foot roadways on 44-foot centers, separated by a 12-foot-wide grassed median flanked by stabilized, grassed shoulders 4 feet wide. Stabilized 10-foot-wide shoulders will be located on the outside of each roadway so that disabled vehicles can pull off the road for repairs.

Acceleration and deceleration lanes will be incorporated at all interchanges and service areas so that there will be no slowdowns for through traffic. All grade crossing will be eliminated, since cross roads and railroads will be carried either over or under the turnpike. Structures carrying the turnpike over existing roads will be constructed as two separate units, one for each roadway. Whenever possible, an existing road will be carried over the turnpike; this requires only a single structure and is more economical.

Grades along the entire route will have a 3 per cent maximum, except for the approaches to the high-level bridge across St. Lucie Canal which will be on a 4½ per cent grade.


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Below: Model 1650-DLU (Fig. 164). Special Birmingham Trailer with extra low deck.

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Waiting time is saved by a DW21, which loads at the bottom of a stockpile along the roadway with the help of an Allis-Chalmers HD-20. The International TD-24 tractor-dozer atop the pile pushes material down to be loaded. This is part of the spread used by Ralph E. Mills Co., Frankfort, Ky.

Changes in alignment will be made by means of long sweeping curves with a maximum curvature of 3 degrees corresponding to a radius of about 1,900 feet.

The pavement will consist of 2½ inches of asphaltic concrete, the 1½ inches binder course topped by a 1-inch surface course. This will be laid on an 8-inch base course of compacted limerock placed on 12 inches of stabilized subbase that has been compacted to a Florida bearing of at least 75 psi. This subbase will be extended a minimum of 12 inches beyond the pavement edge.

J. E. Stanton was the superintendent for Hooper Construction Co. H. R. Stewart was the project manager, and V. R. Bottom, the superintendent, for Ralph E. Mills Co. The consulting section engineering firms on the two projects are Michael Baker, Jr., Inc., Dania, Fla., and Maurice H. Connell & Assoc., Miami, respectively. Howard, Needles, Hammen & Bergendoff of New York City and Kansas City, is the consulting engineering firm for the Turnpike Authority. Thomas B. Manuel is the chairman, and Sam P. Turnbull, the chief engineer, for the Authority. THE END


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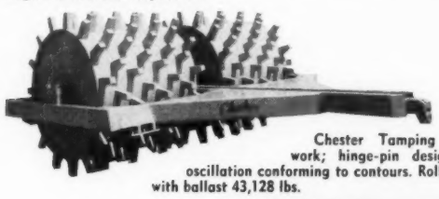
Compare CHESTER Compactors and Rollers on any basis . . . gross weight, rugged construction, special features. You get more weight, more compaction, for your money!

Model 50T4 "FIFTY TON"
Chester Pneumatic Compactor; 4 wheels; extra strong construction. Rolling width 120", weight with ballast 100,000 lbs.



Model 6060 "BIG SIXTY"
Chester Tamping Roller; for heaviest work; hinge-pin design gives "live-action" oscillation conforming to contours. Rolling width 138"; weight with ballast 43,128 lbs.

Model 13W80 "13 WHEELS"
Chester Pneumatic Compactor; for fast, thorough, "cover-all" compaction. Oscillating action of pair-mounted wheels distributes weight evenly. Rolling width 95"; weight with ballast up to 2000 lbs. per wheel. Available in 9, 11 and 15 wheel models.

Write or phone for name of nearest dealer. Limited number of dealerships available; contact: Roger W. Ach, Sales Manager, for details.

CHESTER PRODUCTS CO.
Division of Ransohoff, Inc.
North Fifth & Ford Blvd. Hamilton, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 553

9,000 sq. ft. of Symons Forms reused 12 times on this job. William Baumeister Const. Co., St. Paul, Gen. Cont.


Spandrel Beam Forming Cost Cut 2/3 with Symons Forms

Because of the efficient combination of Symons forming, shoring and scaffolding methods, the contractor was able to cut his estimated cost by two-thirds on the $2,000,000 home office building of the Minnesota Mutual Life Insurance Company of St. Paul, Minnesota.

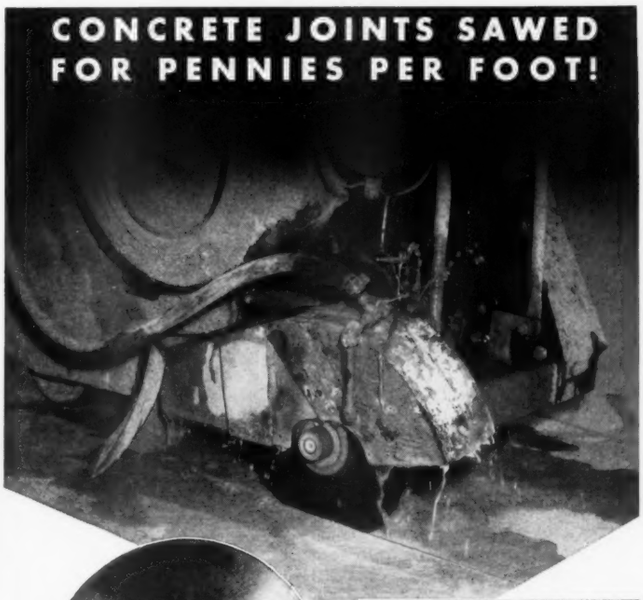
In addition to savings in labor cost, considerable time was saved in forming the Spandrel Beams of this 9-story building. The adaptability of Symons Shores with their safe "T" heads speeded the forming and scaffolding work. 2 x 8 ft. Symons Steel Rib forms were used to frame 56,000 square feet of Spandrel Beams. Symons Shores were used throughout in beam construction. All foundation walls are 16 feet in height.

Send for our Catalog F-10 which gives complete information on Symons Forming. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. A-7, Chicago 39, Illinois.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 554



CONCRETE JOINTS SAWED FOR PENNIES PER FOOT!



Sawing road joints to control cracking is now required in 19 states.

BAY STATE'S NEW REINFORCED ABRASIVE BLADES give you tremendous advantages in economy. Actual experience on both highway and airport jobs shows costs per inch foot of cut between 1½ and 6 cents, depending upon the aggregate.

Specifically designed for wet cutting in green concrete, KRETE-KUT and SAF-T-CUT BZ2 blades are available immediately in all four thicknesses normally required by contracts. The standard 14" diameter readily handles all the depths usually specified, and arbor holes are made to fit each of the popular concrete saws.

Testing KRETE-KUT and SAF-T-CUT BZ2 is the best way to get the lowest concrete cutting costs! Contact your local BAY STATE DISTRIBUTOR, or write to us in Westboro for details.

BAY STATE WHEELS of PROGRESS
BAY STATE ABRASIVE PRODUCTS CO.,
Westboro, Mass., U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 555

# ahead for changing highway sign

***Number of messages can be flashed by illuminated sign; wording can be changed by remote, manual, electronic control***

A highway warning sign that can be changed by remote, manual, or electronic control to any one of many messages, and which can be read day or night at a distance of about 1,500 feet, is gaining enthusiastic acceptance by some highway officials.

Designed and built by Tele-Dynamics, Inc., Philadelphia, Pa., and under exhaustive field tests for the past 2½ years, the new sign has now been standardized to facilitate assembly-line production.

The new model, made up of single 24-inch-high sections, differs from the test model, a triple-unit sign over 7 feet high. Single sections can be stacked one above the other, forming a sign similar to the old model, but the big advantage of the new sign is that single sections can be strung out in tandem at bridge and tunnel approaches.

The message unit in each section is a revolving triangular unit capable of carrying three lines of lettering—one on each side of the triangle. Two 8-foot-long General Electric 74-watt fluorescent tubes, which light up the letters from the rear, remain stationary inside the triangular unit which turns any one of its sides toward the highway for motorists to see.

. Single sections carry three messages of one word each. These sections can be stacked, and the words they carry carefully selected, to form many multi-word messages.

The original test model, for instance, which is located on the shoulder of the east-bound lane of the Pennsylvania Turnpike, consists of three stacked sections that provide five messages. The messages read: "Clear Roadway," "Danger Roadway Freezing," "Slow Roadway Wet," "Danger Fog," and "Danger Snow." The triangular unit in the top section carries the three words "Clear," "Danger" and "Slow."

The fluorescent tubes inside the triangular units are usually operative at all times, going out only when the unit turns to form a new message. The 12-inch-high series E-type letters on this unit are usually of white Plexiglass. Lettering can be supplied in any other color—including red, green, and amber—and both white and colored lettering can be carried by each unit. One message on a sign, —"Danger Roadway Freezing", for instance—might have red letters to make this important message stand out sharply in a color that usually denotes danger. Optional lights for the sign are amber blinkers, advising caution, and red blinkers, advising danger, which can be activated at individual signs.

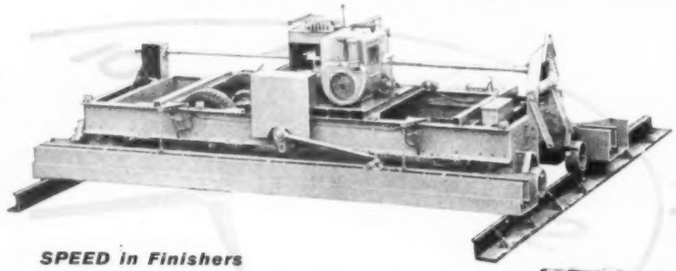
The revolving triangular message unit, the fluorescent light, the electric motor and gear drives, and the electronic relays and switches are housed in a rectangular steel casing


## the *BIG* difference is *SPEED*...

The big difference that puts Rex Concrete Paving Equipment way ahead is speed...fastest over-all operation that puts extra profit in your pocket. *Speed* of operation...*speed* in getting to, on, and away from the job...these are the plus features that keep your jobs moving ahead of schedule.

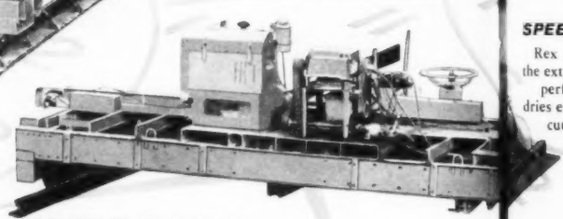
Only Rex gives you a complete line of portable and powered-frame widening paving equipment ...only Rex gives you the top-quality performance that puts you ahead to stay!

But don't take our word for it. Stop in at Booth 724 at the Road Show and see for yourself the extra Rex features that mean important time and money savings on your concrete paving projects. CHAIN Belt Company, 4666 W. Greenfield Ave., Milwaukee 1, Wis.



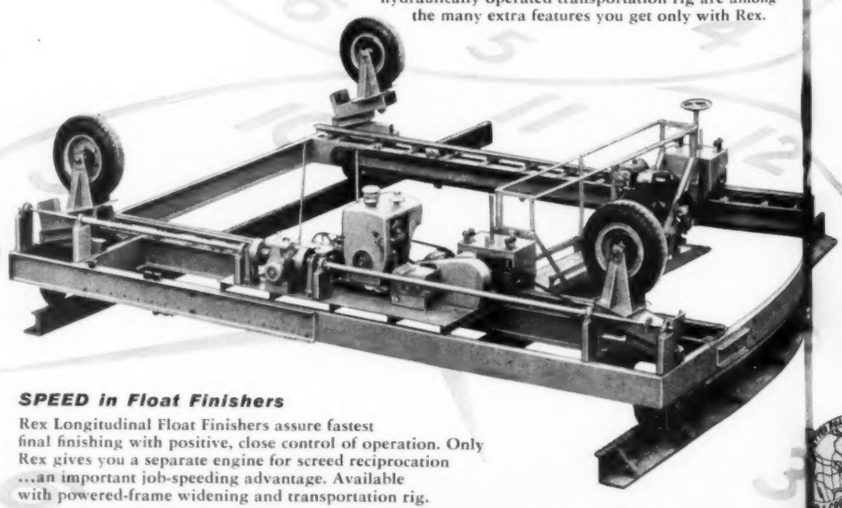
***SPEED in Finishers***

Rex Finishers give you the biggest screeds... 16 inches...plus 24 working combinations of screed and travel speeds that add up to far faster finishing. Powered-frame widening and hydraulic transportation rig, too!



***SPEED in Spreaders***

Rex Spreaders have extra speed that keeps them right on top of the paver. Powered-frame widening and hydraulically operated transportation rig are among the many extra features you get only with Rex.



***SPEED in Float Finishers***

Rex Longitudinal Float Finishers assure fastest final finishing with positive, close control of operation. Only Rex gives you a separate engine for screed reciprocation ...an important job-speeding advantage. Available with powered-frame widening and transportation rig.

141 inches long, 24 inches high, and 22 inches deep. A 16-inch-high, 9-foot-long crystal glass front protects the revolving unit from the weather. Usually finished only with a primer and a flat black coat of paint, the housing can also be built of aluminum at extra cost.

#### Automatic controls

Messages can be changed easily by remote control that requires either radio apparatus or land lines, manual control at the sign itself, and electronic sensing devices that go into operation as freezing weather, snow, or fog move into an area.

The remote control setup—whether it uses radio or land lines—is operated with a telephone type dial. A code number, corresponding to a specific road sign, is dialed first. Then a single digit, corresponding to a specific combination of words, is dialed to make the message change. If there are a number of signs along a roadway, each will have its own code number and will not change its message until that code number is dialed. One master control number can also be dialed to change the messages on a group of signs.

The dialing apparatus can be operated from a central headquarters or a car equipped with a mobile radio. Land wires or radio can be used to transmit the dialing impulses from a central headquarters, but a mobile radio transmitter can only be used if control is made from an automobile.

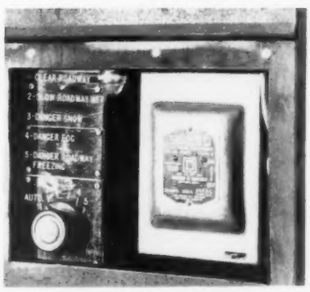
Local control is possible by a switch located at the sign. This switch can be turned to any specific numbered message. The electronic devices, at the sign, sensitive to atmospheric changes, change the sign automatically when there is a change in the weather.

The Pennsylvania Turnpike sign changes from "Clear Roadway" to "Slow Roadway Wet". Sensing devices, on top of the sign at right, and a thermometer, below the sign at left, provide electronic control.

For general use, the remote control setup is best, since it permits a great number of signs to be changed in a short time. Also, messages about changes in traffic flow or hazardous driving conditions due to causes other than weather can be posted. Another big feature of this setup is that messages can be posted in a matter of minutes calling for reduced speeds when snow, fog, or icy conditions prevail. Without this setup, maintenance or patrol personnel would have to be sent out onto the road to change individual signs.

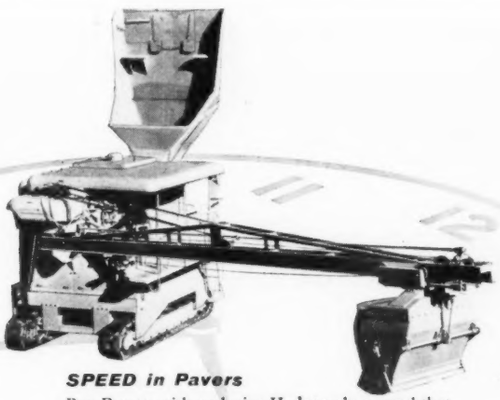
The interior of the 22-inch-deep sign consists of a triangular revolving unit, two fluorescent tubes for each unit, electric motor and gears, and electronic relays and switches.

The sign will also do a great deal toward eliminating traffic jams. Whenever an accident or tie-up on the road threatens to block traffic flow, road signs can be changed to inform motorists of the situation ahead and



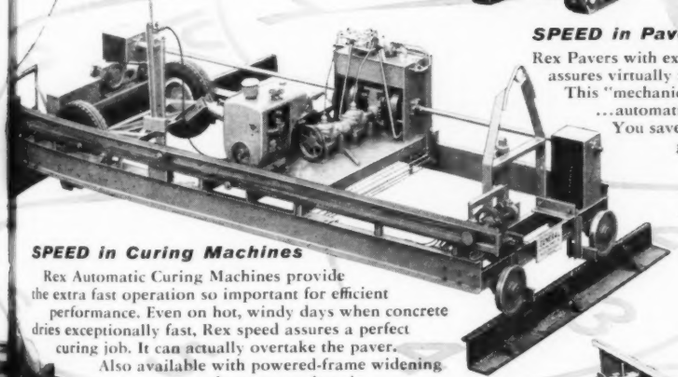
A manual control box in each sign has a switch that can be turned to a specific number corresponding to a specific message. Messages are listed numerically on the left.


see for yourself in booth 724 at the road show



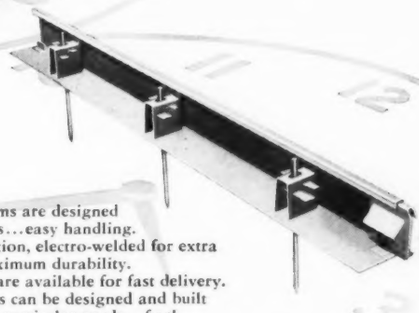
**SPEED in Pavers**

Rex Pavers with exclusive Hydrocycle control that assures virtually foolproof high-production operation. This "mechanical brain" eliminates the human element ...automatically controls the entire batch cycle. You save seconds on every batch... get more batches per day.



**SPEED in Curing Machines**

Rex Automatic Curing Machines provide the extra fast operation so important for efficient performance. Even on hot, windy days when concrete dries exceptionally fast, Rex speed assures a perfect curing job. It can actually overtake the paver. Also available with powered-frame widening and transportation rig.



**SPEED in Forms**

Rex Road and Airport Forms are designed and built for fast setups...easy handling. Special alloy-steel construction, electro-welded for extra strength, assures maximum durability. And Rex Forms are available for fast delivery. Special forms can be designed and built for your particular needs...fast!

REX®

**SPEED, Too, in...**

...Rex Adjusta-Wate Moto-Mixers®, the truck mixers that give you fastest over-all job cycles...Rex Building Mixers, Pumps, Railporter and Pumpcrete®...curb, gutter and sidewalk forms...top-quality construction equipment designed to assure profitable operation, job-speeding performance for you.

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

CONSTRUCTION REX MACHINERY

PAVERS • SPREADERS • FINISHERS • FLOATS • CURING MACHINES • FORMS

CHAIN BELT COMPANY

MOTO-MIXERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER • PUMPS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 556

a possible tie-up if they do not leave the road at the next exit.

One of the most important features of the sign is that maintenance of the sign is simple. The original test model on the Pennsylvania Turnpike has been exposed to all types of weather conditions and subjected to many tests during 2½ years, and in all that time, only one painting has been required. Maintenance and modifications on the standardized model have been negligible.

Responsible for the development of the sign in Tele-Dynamics are L. P. Clark, vice president; Joseph Heisler, machine shop foreman; and Amnon Brosh, systems engineer. Recognition is also given to Louis Bender of the Port of New York Authority.

THE END

## Earthmoving equipment

■ A new booklet from the Allis-Chalmers Mfg. Co. describes the complete line of earthmoving equipment manufactured by the company. Entitled "Facts", the booklet covers A-C crawler tractors, tractor-shovels, motor graders, pull-type scrapers, and motor graders. The booklet is generously illustrated with photos of A-C rigs in action on typical earthmoving jobs.

To obtain Form MS-1138 write to the Construction Machinery Division, Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 3.

*See the Allis-Chalmers Mfg. Co. at the Road Show in the International Amphitheatre, Booths 601, 603, and 621.*

## Forms and form hardware

■ A booklet from Simplex Forms System, Inc., describes the company's complete line of form hardware and plywood forms. Also included are several case-history photographs showing how to save time, labor and money in doing formwork. Photographs and descriptions of the braces, panels, fillers, and corners in the Simplex line, along with the form hardware to go with the plywood forms, are also included.

To obtain this booklet write to Simplex Forms System, Inc., 2500 N. Main St., Rockford, Ill., or use the Request Card at page 18. Circle No. 14.

## Rough idling explained

■ The various causes for rough idling and stalling in engines are listed in a service bulletin from the Pennsylvania Refining Co. According to engineering studies, the bulletin points out, the most common cause for rough idling is the accumulation of gum, dirt, and carbon deposits in the carburetor. Periodic cleaning of the carburetor is the solution recommended by the bulletin. The bulletin discusses the ease with which a carburetor may be thoroughly cleaned right on the engine in a few minutes with Gumout cleaner.

To obtain Bulletin No. 104 write to the Pennsylvania Refining Co., 2686 Lisbon Road, Cleveland 4, Ohio, or use the Request Card at page 18. Circle No. 13.

## Wire rope endings

■ Dualoc wire rope endings are described in a folder from American Chain & Cable Co., Inc. Dualoc, a wire rope ending with a thimble or loop, is double-locked. The wire ends are permanently anchored under steel collars, according to the folder. Job photos and pertinent specifications are included in the folder.

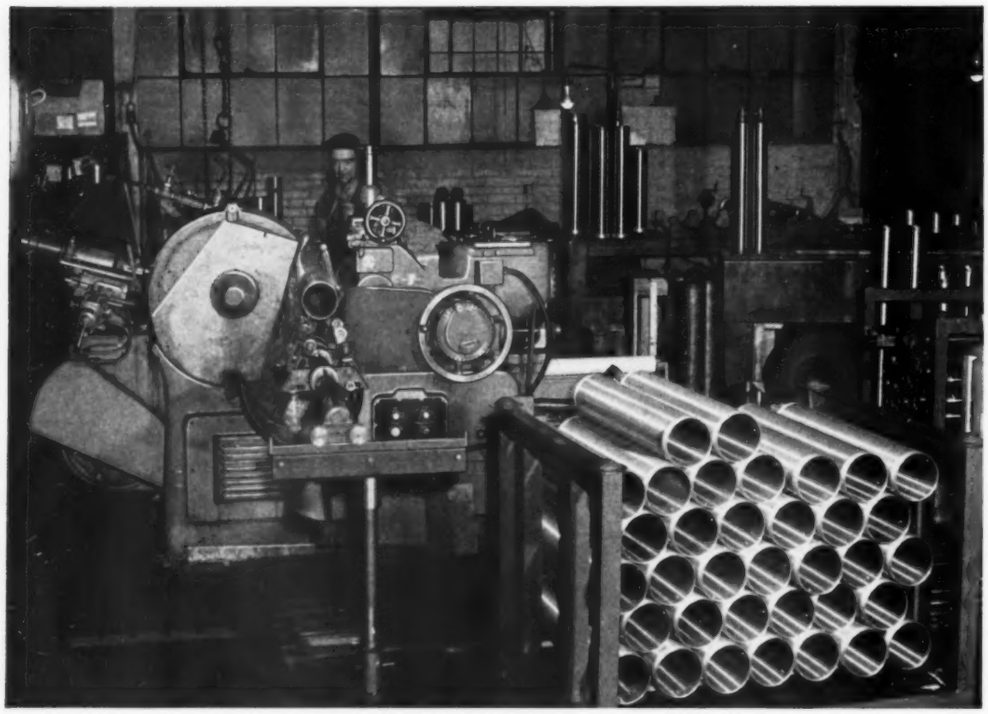
To obtain Folder No. DH-531 write to the Wire Rope Sling Dept., American Chain & Cable Co., Inc., Wilkes-Barre, Pa., or use the Request Card that is bound in at page 18 of this issue. Circle No. 172.

## Pettibone Mulliken Corp. acquires Mercury Mfg. Co.

Pettibone Mulliken Corp., Chicago, Ill., has announced its acquisition of the Mercury Mfg. Co., also of Chicago, through an exchange of stock.

Products manufactured by Mercury include tow tractors, electric lift trucks, and trailers.


**. . . more payload . . . more profits with Galion!**



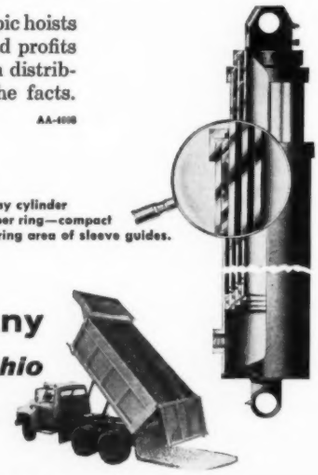
Duo-scopic hoist cylinders are ground mirror-smooth on this modern centerless grinder.

**to assure top quality . . . top performance**

**DUO-SCOPIC CYLINDERS are GALION-built**

You can depend on the quality, performance and durability of the Duo-scopic cylinders in your Galion telescopic hoists. That's because Duo-scopic hoist cylinders are designed by Galion engineers . . . built by Galion craftsmen . . . backed by over 40 years of hoist design and construction leadership.

Find out how Duo-scopic hoists can increase payloads and profits on your jobs. The Galion distributor near you has all the facts. Call him today! AA-4098



Magnified view of cutaway cylinder shows seal-protecting wiper ring—compact chevron seals—large bearing area of sleeve guides.

**GALION Allsteel Body Company**

*Galion, Ohio*

See us at the Road Show—Booth 423

For more facts, use Reader-Reply Card opposite page 18 and circle No. 557



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CAISSONS
SHAFTS
*DRILLED AND UNDERREAMED*
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*SPECIAL DRILLING PROBLEMS*

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Wire or phone for a quotation on your next foundation job — *ANYWHERE IN THE WORLD*

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For more facts, circle No. 558

## Culvert end sections

■ The advantages of employing Armco end sections when constructing culverts under roadways is discussed in a folder from Armco Drainage & Metal Products, Inc. According to the literature, use of the end sections gives added safety, improves appearance, and requires less maintenance. Photographs and drawings illustrate the text. To obtain this literature write to Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 313.

*Visit Armco Drainage & Metal Products, Inc., at the Road Show in the International Amphitheatre, Booth 419, and Booth 107 (Materials and Supply Section).*

## Sound-powered telephones

■ A bulletin covering the sound-powered telephone equipment manufactured by the Wheeler Insulated Wire Co., Inc., is available from the company. The sound-powered telephone is recommended for use in batch plants and wherever a comparatively simple, economical communications system for limited distances is required. The bulletin discusses the various application of the system and lists its important features.

To obtain Form SA-25A write to The Wheeler Insulated Wire Co., Inc., Waterbury 20, Conn., or use the Request Card at page 18. Circle No. 20.

## Wagner Iron Works news

Arthur A. Beck is the new manager of sales-promotion-advertising for the Wagner Iron Works, Milwaukee, Wis. Beck will develop programs for the firm, integrating into them the new sales concepts conceived by W. J. Schlapman, Wagner's vice president of sales.

ONE MAN always on the job for F. & A. Bricklaying Contractors, Camp Springs, Md., is Charles A. "Fuzzy" Payne. He is operating a TD-9 loader during excavation and grading at a housing development not far from Camp Springs. Payne lost his left arm in an accident on a construction job, but the firm counts itself lucky to have him as a loader operator and to double on dump trucks and other equipment.


Quick starts down to 65° BELOW ZERO for Diesel and gasoline engines

SPRAY STARTING FLUID, with the propellent used in the pressurized can, insures quick starts for Diesel and gasoline engines in temperatures as low as 65° F. below zero and withstands 180° F. heat. This combustible propellent was developed after two years of research. SPRAY STARTING FLUID pressurized with our inert propellent is absolutely safe and odorless in storage.

SPRAY STARTING FLUID is sold through distributors, wholesalers and their dealers located throughout the United States and Canada.

**SPRAY PRODUCTS CORPORATION**

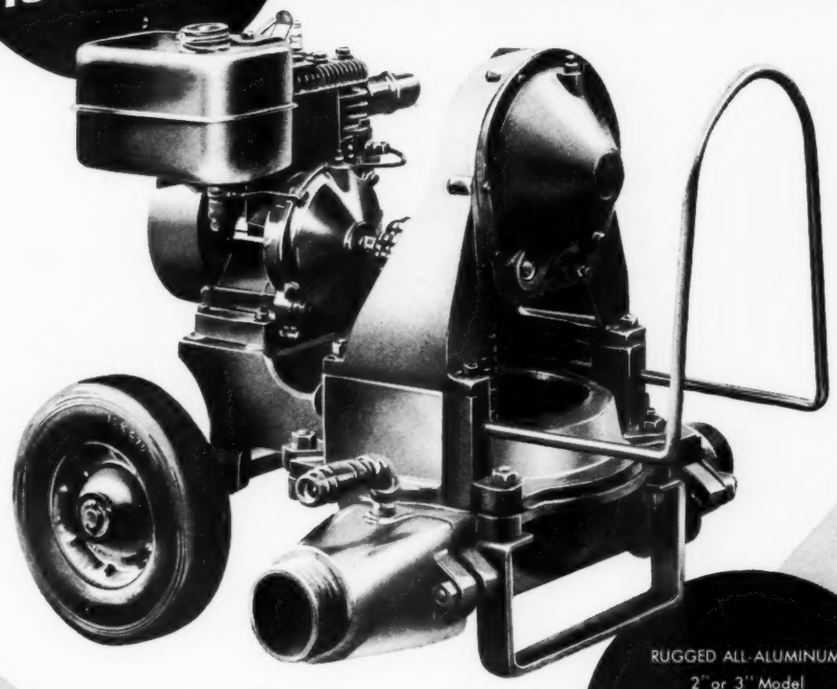
P. O. BOX 584 • CAMDEN 1, NEW JERSEY

For more facts, circle No. 559



ANOTHER FAMOUS HUMDINGER

NEW LIGHTWEIGHT DIAPHRAGM PUMP



RUGGED ALL-ALUMINUM 2" or 3" Model

WEIGHS ONLY 125 lbs.

SEE IT IN ACTION AT THE A.R.B.A. ROAD SHOW

JAN. 28 - FEB. 2

International Amphitheatre, Chicago

Carter Booth located in the Arena, North Hall Booth 407

**RALPH B. CARTER CO.** 192 ATLANTIC ST. HACKENSACK, N.J.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 560

# Permanent structures built with cofferdam techniques

***Unusual methods work successfully for several different projects; job to be done influences the choice of a type of cofferdam***

by A. D. QUINN, vice president and chief engineer
Frederick Snare Corp., New York, N. Y.

Designing and constructing cofferdams is one of the most important jobs for contractors, since the engineer—no matter how important the project—usually places design responsibility directly on the contractor's shoulders.

But if a contractor studies the problems connected with the job and the cofferdam thoroughly, an economical and successful installation will result.

Several well-known projects built by the Frederick Snare Corp., New York, N. Y., illustrate how unusual cofferdam techniques required on several projects turned out successfully. One of these jobs was on a large bridge foundation, another was a deep water pier in Texas for unloading bauxite, the third was the construction of a harbor on Lake Superior for the iron-ore industry, and the last was a generating station built on Staten Island, N. Y., for one of the large utility companies. On each job, a particular type of cofferdam was constructed for definite reasons.

### Bold technique for bridge

One of the more unique projects involved construction of the two anchorages for the suspension span and fifteen piers for approach spans of the $45 million Chesapeake Bay Bridge. This bridge, built for the Maryland State Roads Commission between Sandy Point and Kent Island, Maryland, and with J. E. Greiner, Baltimore, as the consulting engineering firm, is some 7¾ miles in length, including 3⅜ miles of approach roadways.

Each anchorage consisted of a concrete structure, 78 feet 6 inches wide × 150 feet 6 inches long, supported on steel bearing piles. These were cut off 43 feet below the water level for one anchorage and 33 feet for the other. They were capped with a 20-foot-thick block of tremie concrete for one anchorage and a 17-foot-thick block for the other. Concrete for the remainder of the anchorage above the tremie seal had to be placed in the dry.

The bay bottom at the deepest of the two anchorages was 57 feet below water level and consisted of soft silt to elevation minus 107, where a good bearing stratum of sand was located.

The first step in building the anchorage was the dredging of silt to elevation minus 107 and backfilling with sand to elevation minus 64—the level of the bottom of the tremie concrete seal.

A study was made of different methods for driving the 600 steel H-piles—most of which were on a batter—and for doing the concrete work on the anchorage. The piles could have been driven with floating pile drivers, but because of the rough water that sometimes prevailed in Chesapeake Bay, it was felt that the piles would be driven more accurately to position and batter if the driving were done from a fixed support.

A preliminary design indicated that the same type of cofferdam construction used for one of the piers of the

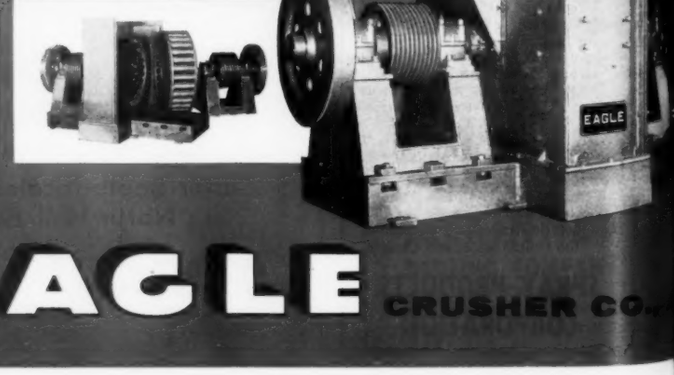
Eagle crushergi
mobile crushing plants are a part oday

18 x 36 JAW CRUSHER—This portable jaw crusher plant is producing crushed stone and aggregate for cushioning the concrete on nearby super-highway. It delivers at the rate of 125 tons per hour—receives its power from electric generator set. Heart of this crushing plant is an 18 x 36 roller bearing jaw crusher—ready to tackle any crushable material that enters its super-tough manganese steel jaws.

stationary crushers for every need epe

4-CAGE DISINTEGRATING MILL
The market for fines is on the steady increase. Be prepared to meet the demand with this new mill—important addition to a distinguished line of crushers and pulverizers.

Quick access—when occasion demands it you can get at and into this Eagle cage mill faster than into any comparable model. Remove pin to raise hinged lid, then 6 bolts to remove access plate.




EAGLE CRUSHER CO.

San Francisco Oakland Bay Bridge be used. This bold cofferdam technique, for one of the piers not constructed by caissons, had 36-inch WF master piles driven around the periphery of the pier, then connected with flat arches of straight-web sheet piling to form a rectangular cofferdam. The depth of excavation for this pier was 50 feet below water. It was backfilled to elevation minus 45 feet and the cofferdam unwatered to elevation minus 29 feet.

It was believed that a similar cofferdam would work for the Chesapeake Bay Bridge, even though the cofferdam for the deepest anchorage had to be excavated and unwatered to depths about 50 per cent greater than those for the San Francisco-Oakland Bay Span. It also developed that with the master piles driven into the sand backfill, the pile-driving equipment could be supported on a traveling bridge running on rails that were placed on girders atop the 36-inch master piles. Further investigation showed that because of the high bending strength of the master piles, which could be considered fixed at the bottom by the tremie concrete seal, underwater bracing could be eliminated and the cofferdam supported by one tier of bracing above water level.

#### Construction advantages

This had certain distinct advantages: It made expensive underwater bracing unnecessary and it provided an unobstructed space for the erection of forms and the placing of reinforcing for the construction of the anchorage structure in the dry above the tremie concrete seal. Although it was recognized that we were pioneering in a cofferdam of unusual size and depth, we decided to proceed with this type of construction for both of the anchorages—installing the shallower one first.

Sheet piling, welded to the outside flange of master piles, permitted the water load to be carried in tension through sheet-pile interlocks to the master piles of this cofferdam for one of the anchorages of the Chesapeake Bay Bridge.

When the cofferdam for the deepest anchorage had been unwatered, its walls had to withstand a maximum pressure of 3,200 pounds per square foot. To enable the structure to carry this pressure, a sheet-pile arch was placed between each master pile. This consisted of Bethlehem SP-4 flat-web sheet piling, interlocked with split sections of the same sheet piling welded to the outside flange of the master piles. This enabled the water load against the cofferdam to be carried in tension through the sheet-pile interlocks to the master piles. Here it was transferred in bending to supports provided by the tremie seal at the bottom and steel wales and struts at the top.

As long as the sheet piling was continuous, without change in direction, the pull on the master piles was balanced and only the load of water had to be transferred by them in bending. At the corners, however, a different condition existed. Here, an anchorage had to be provided to take the unbalanced pull of the sheet piling. This was accomplished by designing a large plate girder placed at 45 degrees to the side and end walls of the cofferdam, as the largest 36-inch rolled section was not strong enough for this purpose. To be sure that the master piles would be fixed at the bottom in the tremie concrete, 1-inch-round U-rods were welded to the inner flanges of the piles before they were driven.

#### Master piles installed

Since the success of the cofferdam depended upon accurate positioning of the master piles, which permitted the sheet-pile arches to be placed with the proper radius, it was necessary to work out a careful method of installation. A wooden platform was first constructed on wood piles. The top pier of steel bracing was erected on top of this platform and supported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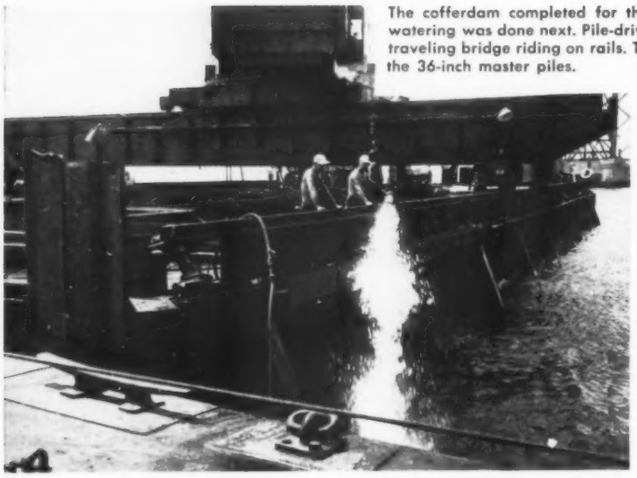

The cofferdam completed for the Chesapeake Bay construction, unwatering was done next. Pile-driving equipment was supported on the traveling bridge riding on rails. The rails rested on girders that topped the 36-inch master piles.

(Continued from preceding page)

on steel piles driven into the sand bottom. The outer flange of the steel wale was provided with holes so that the inner flange of each master pile could be fastened. A temporary wood frame was set up so that piles could be positioned and plumbed as they were driven. These piles were driven to exact grade and, on the two long sides of the cofferdam, were capped with a steel girder to support the rails for the traveling pile-driver bridge. The 14-inch, 73-pound steel batter piles were then driven at every third master pile, to provide lateral support for the cofferdam, and were welded to the master piles near the top. In order to spread out the heavy loads from the pile driver bridge over a greater number of master piles, and to give the cofferdam additional rigidity at the top, a 6-foot-deep vertical steel truss was welded to the outside flanges of the master piles all around the cofferdam.

With the cofferdam bracing thus supported to take both vertical and lateral loads, the traveling bridge was placed on the rails and the pile driving equipment erected on the bridge. This equipment consists of a whirley crane and pile-driving leads, the crane capable of supporting 40 tons at a radius of 40 feet. It could revolve 360 degrees and move laterally on rails on the bridge girders. The bridge was capable of being moved from one end of the cofferdam to the other, so that all of the piles could be reached by the pile driver. The crane was provided with special telescoping leads which could be extended with the hammer to 54 feet below water level. The leads could also be changed from a vertical to an inclined position to drive the piles on a 5 on 12 batter in either a forward or backward direction. This setup made it possible for the permanent piles for the anchorage support to be accurately positioned and driven.

### Pile-driving sequence

Each of the 600 piles was numbered, and a pile-driving sequence was worked out, requiring a minimum number of moves by the crane and bridge so that the equipment would not interfere with piles already driven. This presented quite a prob-


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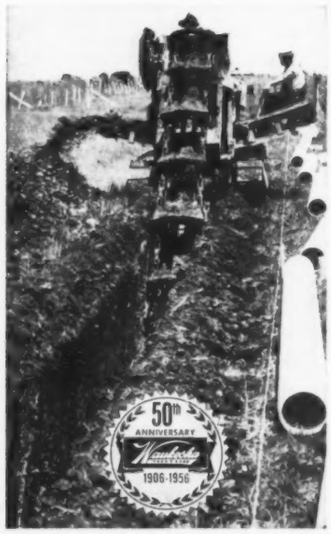


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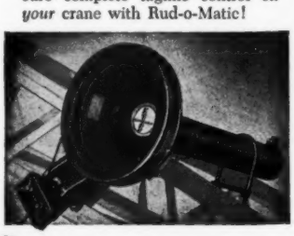

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lem because the piles projected some 21 feet above the bottom in one cofferdam and 19 feet in the other to be embedded in the tremie concrete seal. With vertical piles and batter piles in both directions, care had to be taken to see that there would be proper clearance for the pile-driving leads. The pile driving took about four months for each cofferdam and there were very few days lost due to bad weather. This would not have been the case had the piles been driven with floating equipment.

Following the completion of the pile driving, three sheet piles were set up and driven between each master pile to complete the closure of the cofferdam. Sand backfill was then placed against the outside of the cofferdams to elevation minus 44 at one cofferdam and minus 35 at the other. This kept the sheet-piling arches from deforming from the pressure of the tremie concrete seal which tended to put the arches in compression temporarily, instead of the tension for which they were designed.

The 20-foot deep tremie concrete seal, embedding the 600 permanent steel piles for the deepest anchorage, was then placed in a continuous pour that lasted 6 days and required 8,700 cubic yards of concrete. After 14 days, the cofferdam was unwatered to the top of the tremie seal at elevation minus 44, all laitance was removed, and the balance of the anchorage was constructed in the dry.

Although subjected to a maximum head of more than 44 feet of water, the cofferdam had only a negligible amount of leakage, indicating the tightness of the sheet-pile walls that were in tension with the interlocks pulled up tight. The opposite condition is often the case in a cofferdam in open water where the sheet piling is designed to span vertically in bending over bracing supports.

#### Cofferdam part of pier

A project which did not use a cofferdam in the true sense of the word was the pier being built for unloading bauxite at the Point Comfort, Texas works of the Aluminum Co. of

(*Continued on next page*)

Cofferdam work was done in two phases at the Erie Mining Co. port facility on the north shore of Lake Superior. Work was still in progress in the dry in one cofferdam, while the other cofferdam had been flooded at the conclusion of work.


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(Continued from preceding page)

Rock excavation continued through the winter months. Boulders were removed by pre-dredging the site before the cofferdam was built.

America. This cofferdam will actually form a part of the permanent construction, the sheet pile cells being used to retain the natural ground inside.

The plant is being built on Lavaca Bay, about 100 miles southwest of Houston and 25 miles inland from the Gulf of Mexico. At present a shallow waterway between Matagorda Bay and the plant gives barges access to Point Comfort and to Port Lavaca, directly opposite.

A channel 36 feet deep and 150 feet wide will be dredged from deep water to a point south of Alcoa's present plant at Point Comfort, where a deep water basin will be dredged and a 60 × 800 foot pier constructed for the unloading of 45,000-gross-ton bauxite-ore carriers by a huge traveling unloader. This will discharge the bauxite onto a conveyor belt running inland to an aluminum plant now under construction.

The present depth of water at the site of the new pier varies from 1 to 2 feet and is underlaid with from 3 to 4 feet of soft mud. Below this is good bearing soil, consisting of sandy clay with a water content varying between 15 and 24 per cent and having an unconfined compressive strength of 1 to 5 tons per square foot.

### Sheet-pile cells

The good condition of the existing soil, except for the upper 3 to 4 feet and the fact that the pier has to be constructed before dredging starts, led to the adoption of sheet-pile cells for the pier. The use of piles would have meant a delay in the construction of the pier and the removal of a large quantity of good soil which does not have to be removed from inside the cells.

Since the minimum width of pier is 60 feet, cells with circular ends and straight walls are being used. Circular cells requiring more sheet piling were not needed from a construction standpoint as is often the case when each cell must be self-supporting to carry the construction equipment to build the next adjoining cell.

At Point Comfort the sheet pile cells are being set up and driven with equipment working on land because dredging will be done later. The shallow water pointed to the use of an earth dike around the pier area and


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the subsequent removal of the water and soft material within the dike. This dike, now constructed to elevation plus 5, was built with earth excavated for the plant foundations. The hot Texas sun has now evaporated the shallow water within the dike and the soft material is drying out. This will be removed shortly and the area covered with a thin layer of sand and shell—a good fill obtainable locally—to form a working base for setting up and driving the sheet piling.

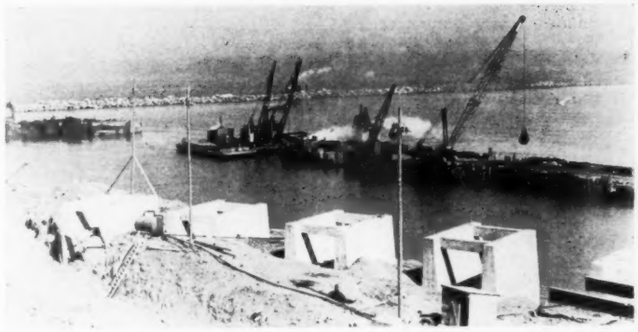
The sheet piling to be used is the straight-web type, 45 feet long. It will be driven to elevation minus 42, which is 6 feet below the dredged bottom. The top of the sheeting will be at elevation plus 3 feet and it will be encased with concrete along the exterior curved faces to 2 feet below water level.

There will be 30 cells spaced 28 feet 10 inches on center having curved ends with a radius of 28 feet 10 inches. The maximum interlock tension is 5,900 pounds per linear inch. The sheeting is specified to have an ultimate strength of not less than 75,000 pounds per square inch and a minimum interlock strength of 11,000 pounds per linear inch. At each end of the pier will be a circular cell to take the tension from the curved end of the last cell. The outshore circular end will also serve as a turning point for the loaded ore ships. These will come in bow first to be unloaded and will back out and warp around the curved end of the pier so that they are headed bow first when leaving the pier.

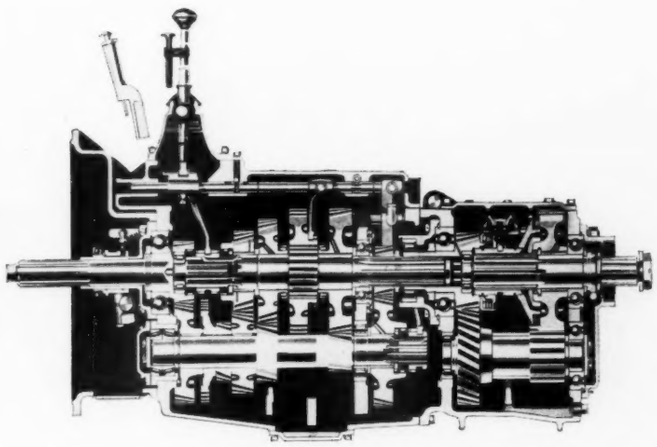
Above the top of the sheet piling at elevation plus 3, concrete dock walls will be constructed to elevation plus 16, the top of the pier. This high elevation places the top of the pier out of reach of the tidal waves that are sometimes whipped up by hurricanes in the Gulf. At each sheet pile cross wall will be a transverse concrete strut connecting the dock walls along each side of the pier. These dock walls will have a wide footing that spans over the arcs of the sheet-pile cells. The dock walls will support the rubber fenders that will absorb the shock of docking ore carriers. The impact force of a ship, one per cent of its gross displacement, or 450 long tons, will be taken by one cell. The dock walls will also support the crane rails used by the bauxite unloader. All this vertical load is carried by the sheet piles in the exterior arcs of the cells and by the adjacent piles in the cross walls.

After the sheet piles have been driven and encased with concrete to

*(Continued on next page)*



Excavation and dock construction completed in Cofferdam 1, the area has been flooded and floating rigs are removing the cells. Excavation inside the cofferdam has provided a 30-foot depth of water at the face of the dock.

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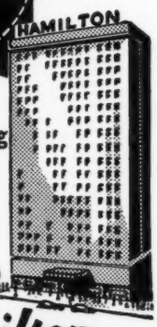


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(Continued from preceding page)

elevation minus 2, a compacted fill will be placed inside the cells to the underside of the footings for the dock walls at elevation plus 2.5. The walls and struts will then be constructed, and the remainder of the cells will be filled to the underside of the paving at elevation plus 16.

The sheet piling, where not encased in concrete, will be protected from corrosion by cathodic protection of the impressed current-rectifier type. This will be provided by graphite anodes, embedded in the soil in the interior of the cells and hung from brackets along the exterior curved faces of the sheet piling about 7 feet below water level. To provide continuity between the sheet piles, each sheet will be welded for a length of 6 inches to the next sheet.

This flood gate in the wall of the cofferdam at the Erie Mining Co. job was designed as a safety precaution. It permitted the cofferdam to be flooded in case of emergency.

### Dock and harbor job

Another cofferdamming method—boldly conceived and planned—was used in constructing a dock and harbor on the north shore of Lake Superior, to enable the Erie Mining Company to ship iron ore in the form of taconite pellets. The Frederick Snare Corp. designed and supervised this important job, a vital part of a $300 million project for mining and processing low-grade iron ore.

This shipping terminal, known as Taconite Harbor, is connected with the mine and plant located at Aurora, about 70 miles inland from the lake, by a new railroad. Taconite pellets are stored in a huge concrete bin along the lake front at the harbor. A dock had to be built in front of this bin so that ore carriers could tie up and be loaded with the ore by a conveyor system.

The lake shore at the harbor was mostly exposed rock that dipped gradually toward the lake. Only at a distance of 250 to 300 feet offshore did water reach a depth of 30 feet. This meant that a considerable amount of rock, much of which was under water, had to be removed before the dock wall could be constructed some 2,450 feet along the shore and a 30-foot depth of water be provided at dockside.

### Work in the dry

When the job was sent out to bid, it was thought that the dock wall would be constructed in the dry. Under this plan, a 30 to 60-foot-wide trench would be excavated to 30 feet below lake level, and the rear face line-drilled and faced with concrete. This would have required dikes or sea walls to be placed along the lake side of the excavation, where the rock was too low to keep out the water at high lake level under stormy conditions. After the dock wall had been constructed, the remainder of the harbor excavation would be done by drilling and blasting the rock, and using floating equipment and underwater dredging for removal.

The low bidder on the job, the Dravo Corp., proposed to do all of the rock and harbor excavation in the dry by constructing a cellular cofferdam outshore from the deepest excavation, in some 35 feet of water, to completely enclose the area to be excavated and to form a dam to keep out the water up to an elevation of 12 feet above lake level.

The dam was made up of 50-foot-diameter cells, connected with circular arcs, of SP-4 section steel sheet piling. The area for a little more than


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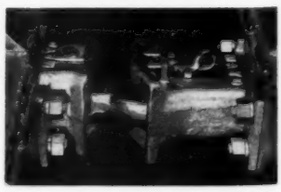

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the width of the cells was predredged to remove boulders and backfilled with 6 to 8 feet of sand and gravel to hold the toe of the sheet piling. A template was positioned and steel stud piles driven, after which the template was raised 1 or 2 feet from its floating position by means of hand winches at each spud well. The sheeting was then set up around the template and driven by floating equipment.

The cells were filled with sand and capped with 3 feet of rock. The cells were completely filled before the arcs were filled, to prevent outside pressure from pushing the cells out of shape. The fill was obtained from the lake bottom and was also hauled by truck from shore over the 20-foot-wide roadway on the completed cells.

**Work divided**

There were two separate phases of cofferdam work. The first cofferdam, which was divided into two parts, permitted the construction of the complete dock wall to be built and the area in front of it excavated. The second cofferdam, considerably smaller, tied into the west end of the first and enabled the remainder of the rock excavation to be done in the harbor. The first cofferdam, extending more than 3,100 feet, was subdivided to permit half of it to be dewatered and excavation started while the cells for the remaining half were being installed. This had to be done because of the tight construction schedule for the coal dock.

Division of the cofferdam was made by two cross walls at about the center of the unit. The first cross wall was removed as soon as the second half of the cofferdam had been completed and unwatered. After the excavation and dock construction was completed in the first half of the cofferdam, the second cross wall was installed to permit flooding and the removal of the part of the cofferdam in front of the coal dock.

Dewatering of the cofferdams was performed by 5,000-gpm pumps. Three pumps were used for the first section of the first cofferdam and one pump was used for the second section. The dewatering of the first section took about five days; dewatering of the second took about seven days. The estimated infiltration, when the cofferdams had been dewatered, amounted to 2,000 gpm for the first section and 1,000 gpm for the second.

As a precaution against damage from the big storms that sometimes occur on a lake, a flood gate was provided in the wall of the cofferdam, permitting the structure to be flooded in case of an emergency. Fortunately,

*(Continued on next page)*

Both temporary cells and permanent cells that form the wing walls were built during construction of the generating screenwell on Staten Island, N. Y. Dredging at the site made it possible for floating equipment to build and fill the cells.

COAST-TO-COAST offices provide

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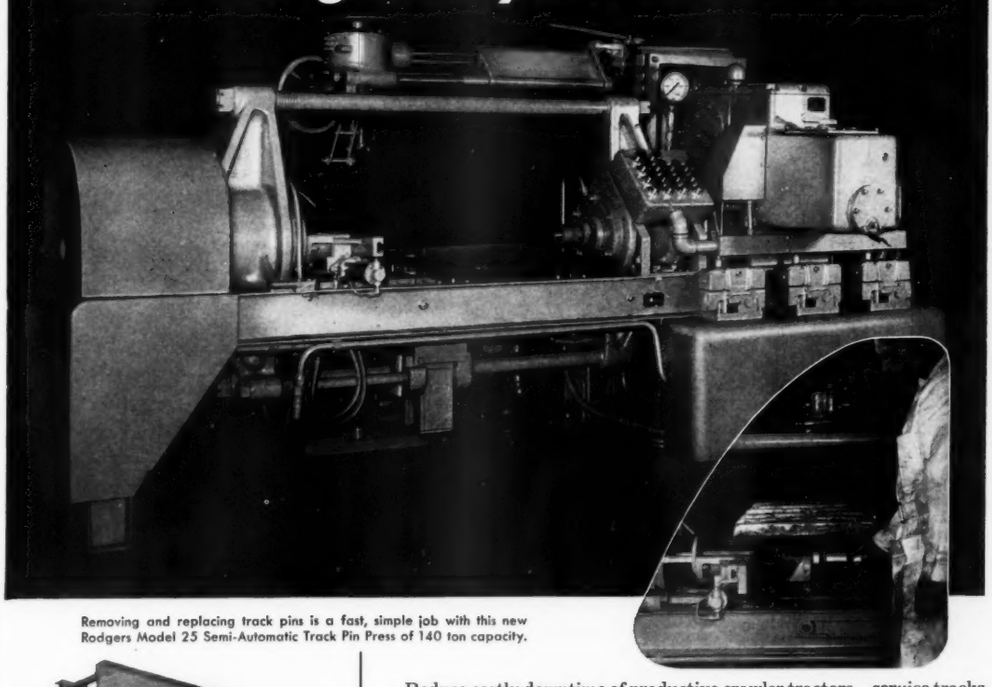
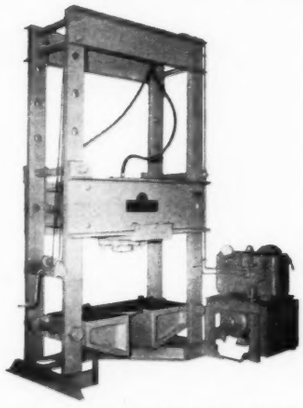
For more facts, circle No. 573



**SAVE MAINTENANCE COSTS**
***with Rodgers Hydraulic Presses***



Removing and replacing track pins is a fast, simple job with this new Rodgers Model 25 Semi-Automatic Track Pin Press of 140 ton capacity.



A Rodgers Shop Press such as this 200 Ton Open Yoke will keep your shop running smoothly and efficiently for both production and maintenance work. Offered in capacities from 60 to 400 tons for pressing, bending, straightening, forming and assembly jobs.

Reduce costly downtime of productive crawler tractors—service tracks faster, cheaper and safer with a Rodgers Hydraulic Track Pin Press. A pioneer in this type of equipment, Rodgers Hydraulic has over 25 years of experience in manufacturing manual and power operated presses for track repair and maintenance. Available in both stationary and portable models, there are Rodgers presses to suit every requirement. The new semi-automatic Model 25 Track Press shown above is one of many new Rodgers presses whose use results in big savings to equipment owners and more profits to repair shops.

**PORTABLE UNIVERSAL SERVICE JACK**—This Rodgers unit is used for pulling and replacing sprockets, gears, pinions, idler brackets and shafts. A valuable tool for any shop, the portability feature makes this jack especially handy for emergency track pin and bushing repairs in the field.

**RODGERS JACKING UNITS**—To push reinforced concrete pipe and metal culverts underground without digging ditches, there are Rodgers Hydraulic Jacks in capacities ranging from 50 to 400 tons. Other versatile applications such as raising bridges and heavy structures effect big savings in time and expense over slower, conventional methods.

**RODGERS SHOP PRESSES**—To perform the tough jobs in your shop there is a large selection of Rodgers Shop Presses in various styles with capacities from 60 to 400 tons. The 200 ton Open Yoke Shop Press illustrated at the left is characteristic of the rugged construction of all Rodgers products.

***Write for literature on Rodgers Track Presses, Shop Presses and other maintenance equipment.***

See Rodgers Exhibit at CHICAGO ROAD SHOW January 28-February 2 BOOTH 368

HI-PRESSURE Rodgers HYDRAULICS

**Rodgers Hydraulic Inc.**

7415 Walker Street, Minneapolis 16, Minn.

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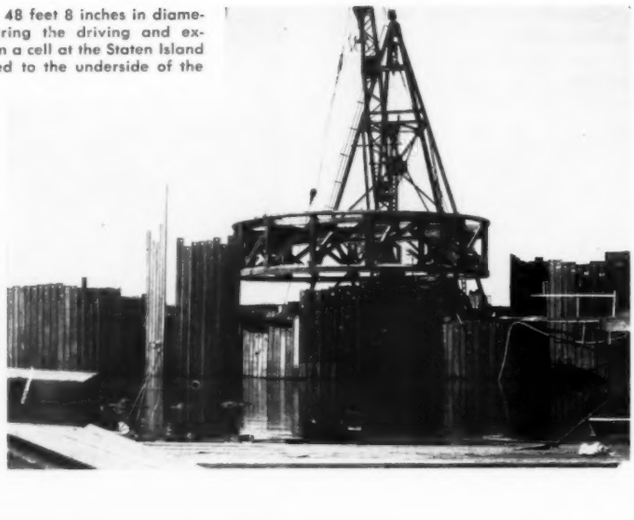

A steel and timber circular frame, 48 feet 8 inches in diameter, which held the sheeting during the driving and excavating operation, was lifted from a cell at the Staten Island site after backfill had been placed to the underside of the frame.

(*Continued from preceding page*)

this gate never had to be operated.

On this project, 81 cells, each 50 feet in diameter, were installed to make the dam about 5,000 feet long. This required about 8,000 tons of sheet piling. The excavation inside the cofferdams amounted to 750,000 cubic yards of rock.

### Screenwell project

Temporary and permanent cofferdams are being combined by Frederick Snare on an entirely different type of project, a screenwell for a new generating station being built for Consolidated Edison Co. on Staten Island.

The initial development of the station on the Arthur Kill River consists of one generating unit with a capacity of 335,000 kw. The screenwell now under construction provides for four circulating water pumps, two of which will be installed to serve the first unit. Each pump will be powered with a 700-hp motor and will circulate 122,000 gpm through a 74-inch discharge line. A gantry crane with two 15-ton hooks will straddle the pumphouse to handle the pumps and screens through roof hatches.

The swampy site, partly under water at low tide, has rock at about elevation minus 30. This is overlaid by a few feet of silty sand and gravel and about 25 feet of silt and organic muck. A shallow fill, placed on land, stops about 70 feet short of the screenwell cofferdam. To reduce the external pressure against the cofferdam cells, and to permit floating equipment to work, the entire site was dredged to elevation minus 14.

To permit work to be done in the dry for the concrete screenwell structure, a cellular cofferdam was built around the construction area. This was combined with cells that will be left permanently in place at each end of the screenwell, forming wing walls that will retain the fill on land adjacent to the intake channel.

### Temporary cofferdam

The temporary cofferdam consists of nine circular cells with connecting arcs, and the permanent wing walls have a total of seven circular cells with connecting arcs. The cells, 49 feet 4 inches in diameter, are of MP 101 flat-web sheet piling from 38 to 47 feet long. This is driven to rock and cut off at elevation plus 12.

To set up and hold the sheeting during driving and excavating the in-


**Naugatuck Surfa-SEALZ**

**Let's build highways to last!**

DETOURS can't be avoided while new highways are being built... but there *is* a way that promises to *keep* those highways in *good condition, longer,* once they are opened! That is by building them with a rubber-bituminous or rubber-asphalt surface course... using Naugatuck's SURFA-SEALZ® as the synthetic rubber additive.

Year by year, test sections of "rubber roads" throughout the country continue to confirm the promise of longer life and greatly reduced maintenance! Accelerated laboratory tests add further evidence of increased adhesion to aggregate and strength of binder under a wide range of temperature and aging conditions.

Experience has shown that admixture of only 8-9% of SURFA-SEALZ makes it possible to use a *softer* asphalt surface, since the rubber retains the natural oils instead of permitting them to bleed to the surface. This greatly postpones the time when embrittlement begins to cause cracking and the need for repairs.

SURFA-SEALZ is readily available in convenient form for admixture at the job... requires no special equipment... involves no complications... adds only slightly to initial paving costs! Isn't it time *you* started making use of its advantages?

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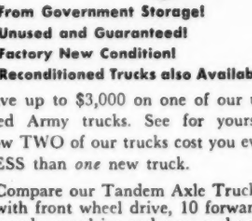

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For more facts, circle No. 576

side of the cells to the top of sand, two circular timber and steel guide frames, 48 feet 8 inches in diameter and 10 feet deep, were built so that sheeting could be set up and driven and excavation done to sand inside the cells. A frame was floated into place and eight temporary H-piles were driven through spud sockets in the frame, which was then lifted a few feet by derrick and suspended from the piles. All the sheet piles were then assembled around the guide frame before any were driven. After the sheet piles had been driven to rock and the soft material inside excavated, the cell was filled to the underside of the frame. Then the frame was removed to allow the filling job to be completed. Two derrick boats are handling the work of filling temporary cells with sand and permanent cells with gravel. Two guide frames are provided so that sheeting can be set up for one cell while the adjacent cell is being excavated and backfilled.

At present, the temporary cells have been completed and the permanent cells are being installed. The interior of the cofferdam will shortly be unwatered and excavated to rock. After the screenwell structure has been built in the dry, the temporary cells will be removed. Cathodic protection will keep the permanent cells from corroding.

In each of these differing projects, a similarity can be observed. The design and construction of the cofferdams in each case depended on the work to be done and the nature of the area. Selecting and building the best type for a particular job was accomplished through a process of evolution. THE END

*(From a paper, "Permanent Structures Built by Cofferdam Techniques", presented by A. D. Quinn before the conference on "Cofferdams — Their Design, Construction and Maintenance" at Princeton University.*

## Overhead jaw crusher

■ An overhead eccentric jaw crusher, Model 4448, is described in a bulletin from the Universal Engineering Corp. The 130,000-pound unit features welded base roller bearings. According to the specifications, stationary jaws are 102 inches long, and movable jaws are 115¼ inches long. Operating speed is 225 rpm. The design and construction of the crusher is detailed, and dimensional drawings and cutaway views are included.

To obtain Bulletin BU 132-561 write to the Universal Engineering Corp., 625 C Ave. N. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 176.

## Petersen names Demarest

V. David Demarest, Jr., has been appointed sales manager of Petersen Engineering Co., Inc., Santa Clara, Calif., manufacturers of the Pengo line of earth augers and tension wire stringing equipment. Demarest, who comes to Petersen from the Aluminum Co. of America, is a member of the AIEE, the Pacific Coast Electrical Association, and the Electric Club of San Francisco.

## Lubricated plug valves

■ A new 28-page catalog from the Homestead Valve Mfg. Co. shows 100 per cent pipe area, venturi, round port, and diamond port lubricated plug valves in a variety of metals for 150 pounds steam working pressure, 200 pounds oil-water-gas, and ASA 150 and 300-pound classes. Also shown are different types of power operators for valves, in addition to complete lines of lever-operated, and worm and gear-operated valves.

To obtain this catalog write to the Homestead Valve Mfg. Co., P. O. Box 550, Coraopolis, Pa., or use the Request Card at page 18. Circle No. 127.

## All-welded clamshells

■ The three leading types of all-welded clamshell buckets available from the Yaun Mfg. Co. are detailed in a brochure from the company. The booklet covers buckets for heavy-duty digging, general purpose operations, and rehandling. Specification tables, diagrammatic sketches, and drawings augment the text.

To obtain this brochure write to the Yaun Mfg. Co., P. O. Box 1508, Baton Rouge, La., or use the Request Card at page 18. Circle No. 17.

*Visit the Yaun Mfg. Co. at the Condex Show in the Conrad Hilton Hotel, Booth 19.*

*See page 104 for the complete list of manufacturers exhibiting at the ARBA Road Show.*

Super 99 Power Grader—6-wheel drive, 6-wheel steer

Hydraulic Crane with live boom action

99-L Power Grader—4-wheel drive, 4-wheel steer

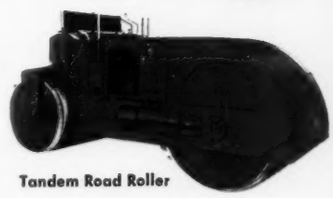
# Here's why it will pay you to go AUSTIN-WESTERN in '57

The men who own and operate Austin-Western equipment will tell you that it's tops in its field. Graders, rollers, sweepers and hydraulic cranes all offer you more extra features than anything else in their class. That's why the A-W red is such a familiar sight on construction, maintenance and materials-handling jobs all over the world. Compare these advantages with those of any similar equipment, and you will see why it will pay you to go Austin-Western in 1957:

- **Power Graders**—Built to give 30% more power *at the blade* than ordinary graders. All-wheel drive, all-wheel steer . . . controlled traction . . . precision side-shift . . . high-lift blade (90° right or left) . . . extreme blade reach . . . completely reversible blade . . . finger-tip hydraulic controls.
- **Road Rollers**—3-wheeled, tandem and portable tandem models . . . variable weight, gas or diesel engines. Torque converter drive is smooth, powerful and flexible.
- **Street Sweepers**—Single or double gutter broom models, in 4-yard and 2-yard sizes . . . front steer for safety and maneuverability . . . rear dump for convenience.
- **Hydraulic Cranes**—The most versatile "arms" in industry, combining pickup, carrying and placement capabilities with the best features of crawler, truck and shop cranes. All movements of the live boom are actuated by fast, smooth hydraulic power. Two or more movements of the boom and cable are possible while the tractor is moving, and the angle can be quickly changed while operating under load. Available with a wide assortment of labor-saving attachments.

Find out more about the complete A-W line that's "Built to Outperform"—see your nearby distributor or write us for complete information.

3-wheel Road Roller



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 577

# Jet interceptor base gets bituminous runway conc

***39 to 45-inch granular base course is laid to prevent frost heave; 6,900-foot asphaltic concrete runway built in short working season***

**1**

Oversize from the crushing plant producing subbase material goes to this Cedarapids Master Tandem crushing and screening setup to be processed as hot-mix aggregate.

**2**

At the aphalt plant, a Barber-Greene 848 with an 860 gradation unit is fed with aggregates by a crane. Plant production kept to an average of 110 tons of hot-mix hourly.

**3**

Starting the job of laying the subbase is this Jersey spreader mounted on a Caterpillar tractor. The select material was put down quickly in 12 to 14-inch lifts.

**4**

A Buffalo-Springfield Kompactor makes three passes over the gravel to develop initial compaction. Additional compaction will develop 100 per cent modified AASHO density.

**5**

This Barber-Greene paver works about 600 feet behind the first so that cold joints will not develop. The 4-inch pavement has a 2½-inch binder and a 1½-inch surface course.

**6**

Galion Roll-O-Matics work in tandem as they complete some finish rolling. The U. S. Army Corps of Engineers inspector, right, is using a straightedge to check surface tolerances.

The processing of earth, granular subbase, and asphaltic concrete to very high densities in a five-month working season have posed only a few of the problems involved in the construction of a new jet interceptor base north of Glasgow, Mont.

Supervised by the Walla Walla District of the U. S. Army Corps of Engineers, this work was done under four contracts worth $5 million by Northwestern Engineering Co., Inc., Glasgow. Several other contracts, totaling $8 million, are being handled by other contractors building streets, housing, and a few of the permanent shops and hangars.

Aside from grading, excavation, and the paving of the 6,900-foot section of the main 150-foot-wide NW-SE runway with 4 inches of asphaltic concrete, Northwestern paved the portland-cement concrete sections at the base. These included the 500-foot-wide, 1,320-foot-long parking apron, the 1,000-foot-long and 17-inch-thick end sections of the main runway, jet blast pads for engine warmup, and the 75-foot-wide taxiways. All pavements and subbases are designed to take 100,000-pound wheel loads.

### Grading sublet

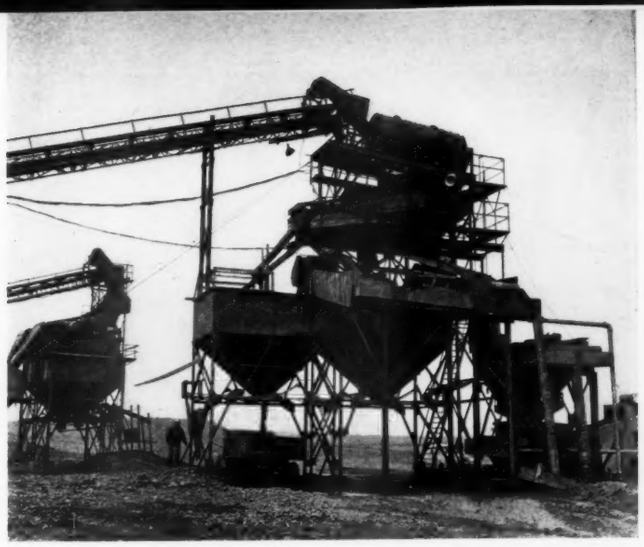
Since construction time was short, Northwestern sublet excavation and grading to Harris Construction Co., Aberdeen, S. Dak., which moved in with a fleet of six TS-18 Euclid scrapers and worked them two 10-hour shifts, six days a week. On this schedule, each machine averaged 69,000 cubic yards of earth per month, compacted in place. With 518 horsepower —300 from the tractor engine and 218 from the scraper engine—these rigs worked without pusher tractors to pick up heaping loads and head out to the fill areas. Harris also used 33.5×33 tires on the scrapers instead of the conventional 27.00×33 tires. These oversize tires, together with no-spin differentials on the machines, gave the rigs the traction they needed to dig and load the heavy gumbo. Altogether, the six units moved about 1,200,000 cubic yards of glacial till and gumbo during this phase of the work.

In this cold section of the country, where temperatures of minus 55 degrees can be expected during winter and where the glacial clays are susceptible to frost heaving, frost penetration was taken into account by specifications for the job. After Ford and Chevrolet tank trucks had hauled water from Porcupine Creek and

*(Continued on page 172)*

# concrete apron, taxiways

***Dirty pit-run material is made into acceptable aggregate for concrete paving by high-output washing and screening plant***



Raw material fed to the Pioneer 405-W washing and screening plant is cleaned of heavy clay by a revolving 72-inch ×12-foot scrubber. The unit was supplied with about 100,000 gallons of water daily for this job.

Portland-cement concrete paving of taxiways, parking apron, and end sections of the 8,900-foot runway at the U. S. Air Force interceptor base at Glasgow, Mont., made good headway, despite complicating factors that would have made a similar job less successful.

Bad weather, a short season, difficulty in securing experienced paving men, a scarcity of rail cars to bring portland cement 480 miles to the job, and night paving all played a part in making this one of the more difficult jobs handled by Northwest Engineering Co., Inc., Rapid City, S. Dak.

The center section of the runway consists of 6,900 feet of asphaltic concrete (see facing page.) Other pavement, subject to damage from jet-fuel spillage and jet blasts, is of portland cement concrete. This includes 1,000-foot sections on each end of the main NW-SE runway, and the 1,300-foot-long, 500-foot-wide parking apron. Both areas were paved in 25-foot lanes, which are interlocked by a keyed joint and, where necessary, by 1-inch steel dowel bars. Sawed contraction joints were filled with waterproof and jet-fuel resistant sealer. In the parking area, copper bars, going into the base course, were embedded in the concrete so that the jets can be tied down.

#### Paving organization

The location of the base—not far from the Canadian border—had a lot to do with the problems that arose as the job was being organized.

In this section of Montana, there were few men experienced with concrete paving; as a result, equipment operators and cement finishers arrived on the job from points as distant as Ohio, Oklahoma, Kansas, Colorado, and Pennsylvania. But though the work was originally expected to last only through October, the high turnover in manpower that was expected as men attempted to get winter jobs in a warmer climate did not materialize.

The closest available source of portland cement for the job was Trident, Mont., 480 miles away, and, as if this were not enough, there was a scarcity of hopper-bottom cement cars to ship the material. When three boxcars of cement did arrive, early in the job, bits of wood from the sides of the cars clung to the cement and mechanics had to repair and adjust the vane-type feeder handling the material.

Concrete paving also had to be done at night during the summer months, because of the high daytime temperatures and the strong surface

(*Continued on next page*)


**buy from the line of strongest design . . . Hercules!**

Hercules Model 1215 high-speed telescopic hoist and CD-20 batching body handles four 5,150 lb. batches for J. A. Jones Construction Co.

**for high-speed, cost-cutting batching work . . .**

**New Hercules hoist raises and dumps *in less than 6 seconds!***

2,500 ft. of 24 ft. x 9 in. slab per 9 hour shift! That's the amazing production pace maintained by J. A. Jones Construction Co., Charlotte, N. C. on a recent by-pass job near Mansfield, Ohio—thanks to Hercules' new high-speed telescopic hoists.

Because the batch trucks could back into the skip, dump, and pull clear *in 11 seconds*, the dual-drum pavers were able to deliver a 37.4 cu. ft. mixed batch at 51 second intervals!

Especially designed for Jones' use on this job, the new Hercules high-speed hoist raises to full dump position in 4 to 6 seconds. A special new bleeder valve provides hydraulic cushioning at the end of the lifting stroke. And, accelerating the truck engine at the top of the stroke provides a rapid 4 to 10 in. rising and falling motion of the truck body. Complete, clean dumping of each batch is assured, without "frogging" the truck. According to the contractor, Hercules 6 second, 4 batch equipment has reduced his investment in batching trucks 20%.

See your Hercules distributor . . . he'll show you how this new hoist and batching body can boost production and cut costs on your paving jobs, too. Call him now!

AA-4612

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**HERCULES STEEL PRODUCTS COMPANY, GALION, OHIO**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 578

(Continued from preceding page)

Rock and sand are separated by Pioneer vibrating screens. The sand goes to an Eagle scalping tank and the usable material to an Eagle sand crew. Here the sand is dehydrated before being stockpiled for transport to the batch plant.

winds. And even though temperatures plunged to the low 40's during July and August nights, the rule was followed rigidly.

Production of concrete aggregates also threatened difficulties, for the supply—from a deposit in Porcupine Creek—was extremely dirty. The pit consisted of quartzite, granite, and other good gravel, but these were badly coated with clay.

#### Aggregate production

Uninterrupted production of concrete aggregates was so important to this job that Northwestern purchased a Pioneer 405-W washing and screening plant to process the pit-run material at the base and meet a quota of at least 100 yards per hour. Additional flotation and washing equipment for the larger-size aggregates was installed when the pit-run material was found to be dirtier than expected—even after debris and trash had been removed manually at the feed end.

A fleet of International 12-yard trucks, loaded at the pit by a Bucyrus-Erie 54-B dragline with Hendrix 2½-yard bucket hauled five miles to the base and dumped to a raw pile near the feed end of the plant. These rigs worked through the cold winter months to make sure that a good stockpile would be ready at the plant during spring months. At this time, floods might be expected on Porcupine Creek, a tributary of the Missouri.

A Caterpillar D8 and U-type dozer pushed the material to a 30-inch electrically powered mechanical feeder that routed the stone to a 24-inch-wide, 160-foot-long conveyor. This brought the gravel to the top of the plant, about 50 feet above ground level.

At the top of the conveyor run, the raw material dumped to a Pioneer 72-inch×12-foot scrubber that dislodged the clay from the gravel. About 100,000 gallons of water were pumped from a nearby creek to the scrubber every hour by two 6-inch centrifugal pumps. As work continued on through the summer, water levels fell so low that all waste water was trained through flumes to settling ponds, permitting fine material to settle and the cleared water to be used again.

The material went from the scrubber to a heavy-duty set of 4×20-foot tandem Pioneer vibrating screens, consisting of 12 and 8-foot sections, where the rock was separated by size. Large rock was scalped off and acceptable coarse aggregate and sand

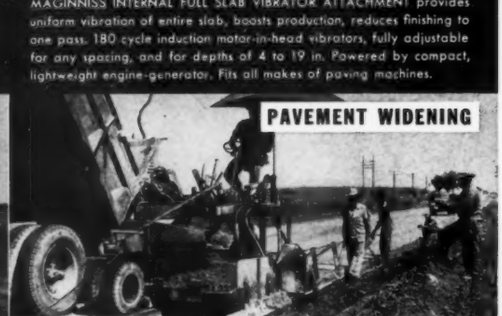

*Vibrate your way to higher profits with...*

**Maginniss Hi-Lectric Concrete Vibrators**

MAGINNISS CONCRETE VIBRATORS speed up pours, cut labor costs, produce blemish-free concrete. Two 180 cycle, 120 volt models; HCV-3 for bridge, pavement and building work; HCV-6 for massive structures. Powered by choice of nine different gasoline or electric driven generators. (Uni-lectric 110 volt universal motor vibrators for smaller jobs, too.)

MAGINNISS INTERNAL FULL SLAB VIBRATOR ATTACHMENT provides uniform vibration of entire slab, boosts production, reduces finishing to one pass. 180 cycle induction motor-in-head vibrators, fully adjustable for any spacing, and for depths of 4 to 19 in. Powered by compact, lightweight engine-generator. Fits all makes of paving machines.

MAGINNISS SIDE FORM VIBRATOR ATTACHMENT fits all makes of paving machines. Prevents honeycomb, eliminates hand labor, speeds production. 180 cycle induction motor-in-head vibrators, fully adjustable for depth and spacing, choice of instant manual or hydraulic retraction. Generator also powers floodlights and service tools.




MAGINNISS PAVEMENT WIDENING VIBRATOR ATTACHMENT fits any widener, eliminates need for accessory vibrating screed or for hand finishing. 180 cycle induction motor-in-head vibrators in hopper plasticize stiffest concrete . . . permit production rates up to 25 fpm on slip-form paving. Generator also powers service tools, floodlights.

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On jobs where profit-conscious contractors are at work, you'll find Maginniss Hi-lectric vibrators in action!

That's because powerful Hi-lectric vibrators with induction motor-in-head design, produce up to 10,500 VPM . . . cut placing time . . . produce sounder, better looking concrete at lower cost.

Whether you're pouring footers, building structures, paving highways or airports, it'll pay you to investigate—and use—the profit-boosting features of Maginniss Hi-lectrics. You'll find that Hi-lectric vibrators offer true one-man operation . . . that they have no cumbersome, hard-to-maintain flexible shafts . . . that they provide plenty of power to handle stiffest concrete mixes with ease.

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retained. An excess of 40-mesh sand in the pit-run material had to be wasted during the manufacture of concrete aggregates, but some of this was added to the subbase material produced by another Pioneer screening plant not far away.

Acceptable sand passed from the screens to be submerged in water in an Eagle 16-foot scalping tank. A triple-cell flume under this unit rejected between 10 and 15 per cent of the sand, and the good portion passed to an Eagle sand dehydrator that turned out a clean and partially dried product. This was stockpiled with the aid of a Pioneer 24-inch belt conveyor.

The ¾-inch to No. 4 aggregate passed from the vibrating screens to an Eagle washer equipped with a trash removing tub end. Wood and other debris that might have been retained up to this point was floated off the stone here before the aggregate went to storage bins. The ¾ through 1½-inch fraction was routed through this same washer before being sent to bin storage. Some of the oversize rock particles were trucked to the crushing plant that turned out hot-mix aggregates.

#### Batching setup

The concrete aggregates, trucked to the Heltzel batching plant, were stockpiled so that they could be charged to the plant by a crane with Owen 1-yard clamshell bucket. Bulk cement was unloaded from rail cars on a Great Northern railroad siding at Glasgow, 18 miles from the site, and brought to the plant by the contractor's bulk cement trucks. Job storage was provided by a Heltzel 1,000-barrel cement silo that was set close to the plant.

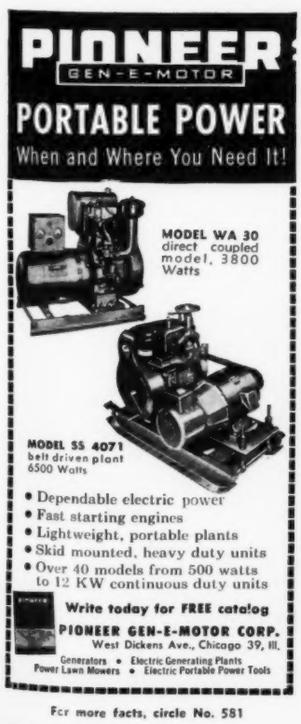
The Heltzel plant, originally a manual type, had been modified by a local electronics expert so that it operated automatically. It loaded dry batches to a fleet of six Mack trucks, each of which hauled five batches or one more than the usual number. The trucks stood up well under the weight of the extra load and made it possible for the contractor to reduce the number of batch trucks needed on the job.

#### Preliminary grade work

Before the paving crew moved down a lane, workmen set the Heltzel steel forms and fine-graded the 17-inch select gravel subbase that had been left slightly full to permit fine-grading to be done between forms. At least one, and sometimes up to three days' paving was outlined in advance. Three types of forms were in use: about 5,000 linear feet of Heltzel 17×17-inch forms; some Heltzel steel radius forms for the curved portions

(*Continued on next page*)

A Mack truck with a special bulk-cement hauling body prepares to unload to the 1,000-barrel silo of the Heltzel batching plant. Aggregates are stockpiled nearby, ready to be charged to the bins.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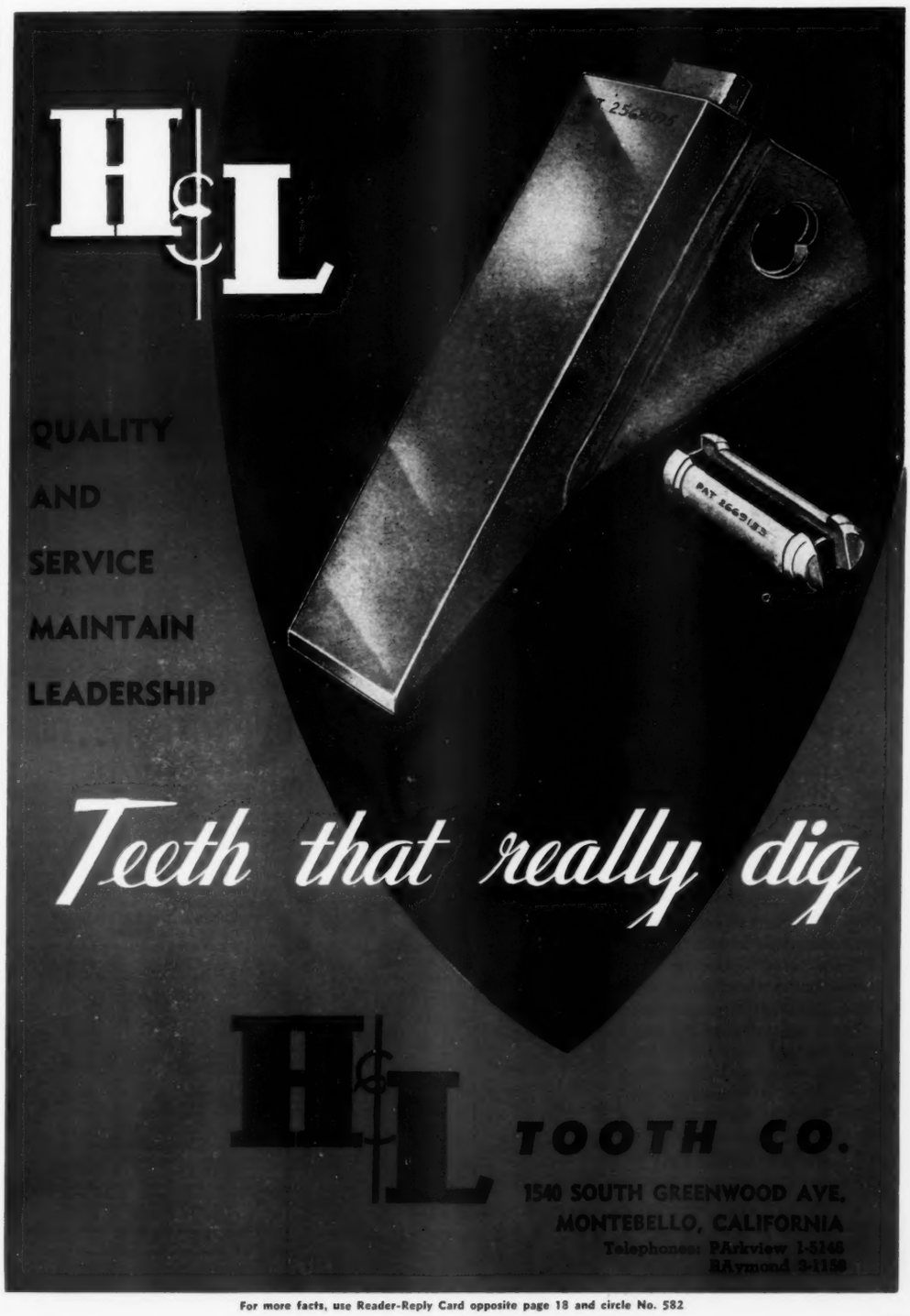


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# EAGLE IRON WORKS

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 584

Heavy sections of Heltzel 17-inch steel forms are set before finegrading is done. This work keeps from one to three days ahead of the paving crews.

*(Continued from preceding page)*

of some of the parking apron approaches; and 2,000 feet of 21-inch steel forms for the 21-inch slabs. The latter were supplied in 10-foot-long sections weighing about 500 pounds each. Heavy pin wells and positive-locking latches kept the forms from rocking under the paving equipment. The steel keyways forming the joints between the lanes were bolted directly to the sides of the forms.

A Pitman Hydra-Lift handled the forms and a 10-man crew set them and drove the pins with compressed air furnished by an Ingersoll Rand 105-cfm compressor once the base had been roughed in by a shop-made blade mounted on a motor grader. The compressor was also used to operate a small sliding plate on which a Viber vibrator was mounted. This compacted the loose earth at the inside edge of the form to insure a slab of the required 17-inch thickness. The Pitman Hydra-Lift, and a Hough Payloader with a pin-pulling fork attached to its front-end loader bucket, pulled pins from the forms.

As soon the the forms had been installed, fine-grading was done by a shop-made planing device mounted on a Caterpillar No. 12 motor grader. The small amount of excess material accumulating at the end of a lane during this operation was either moved out by the grader or loaded directly to the next lane by the Hough Payloader. After a steel-wheel rolling

Form pins are removed by a Pitman Hydra-Lift after forms have been stripped. The slab, coated with a white pigmented curing membrane, is covered with wet burlap for three days during the start of the curing period.

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A Koehring 34-E Twinbatch paver, right, dumps to the grade. A Rex 34-E helps out from the opposite side of the 25-foot lane. Paving crews covered from 800 to 900 feet of lane daily.

of the subgrade had been completed, copper tie-down anchors were screwed into the ground to the proper elevation and racks of dowel bars were laid in place in wire cages.

Since batching facilities were not large enough to keep two pavers busy, a Koehring 34-E Twinbatch dumped concrete to the grade while a Rex 34-E occasionally helped out. Mixing water for the paver was hauled five miles from Porcupine creek because of a high chloride content in the well water on the base. It was transferred to the paver through a trailer-mounted tank.

The fresh batches of concrete, with Durair air-entraining agent added, were dumped on the grade just ahead of a Blaw-Knox spreader. This rig had ten Viber internal-type vibrators mounted at the rear of its frame. Finishing was done by a Jaeger-Lakewood machine, a Koehring transverse screed-type finisher, and a Koehring longitudinal finisher, and the final surface finish was applied by a Heltzel belt machine. Concrete finishers added some final touches with edging tools, long handled floats, and other hand tools.

Working under a subcontract, Techkote Co., El Segundo, Calif., first applied white pigmented Sealtex membrane solution immediately after the finishing, then covered the pavement with wet burlap for the first three days.

Concrete joint sawing was also done under a subcontract with Cecil Hatcher & Assoc., Arcadia, Calif. The joints, ⅛ inch wide and 2¾ inches deep, had a 1-inch-deep widening portion ¼ inch wide. A Concut concrete saw made the cuts in two passes within 14 to 16 hours after the concrete had been placed.

Completing its job a few weeks ago, Northwestern turned in a creditable performance despite the handicaps of the jobs. Paving crews laid between 800 and 900 feet of slab per day, and production figures for concrete ranged between 1,000 and 1,150 cubic yards per day. THE END

### Allis-Chalmers appoints

O. V. Tally, director of industrial sales of Allis-Chalmers' industries group since 1954, has been appointed manager of the firm's Washington district, succeeding R. N. Landreth, who has been assigned to the industries group sales staff.

For more facts, circle No. 586→

### Test molds for concrete

■ Concrete cylinder molds for making concrete compression test specimens are detailed in a bulletin from the Moline Iron Works. Two molds are available; one forms cylinders 6×12 inches in size and the other forms 8×16-inch cylinders. According to the company, Moline cylinder molds are watertight, precise, consistent, and quick acting. The step-by-step procedure involved in making a mold is illustrated.

To obtain Bulletin No. 354 write to the Moline Iron Works, 130 Second St., Moline, Ill., or use the Request Card at page 18. Circle No. 291.


# Here's the NEW SS-24 "EUC" SCRAPER

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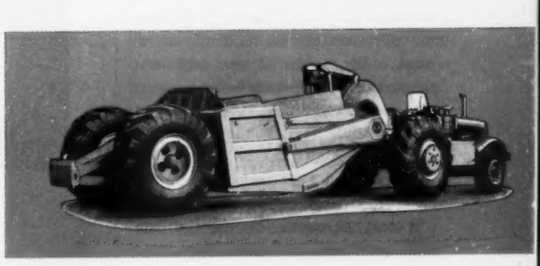

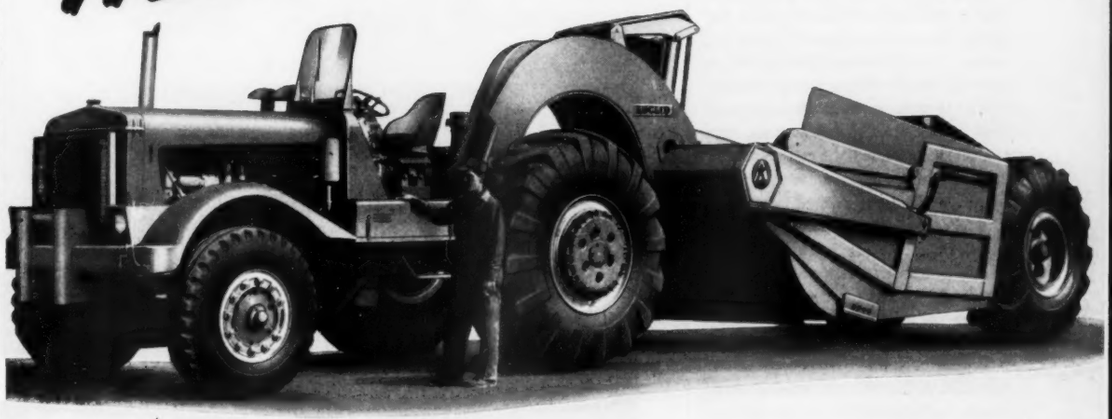

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Six wheel design of this SS-24 gives it exceptional stability for long fast hauls. It is equipped with No-Spin differential, Euclid planetary drive axle and 27.00 x 33 drive and scraper tires (33.5 x 33 are optional). Euclid hydraulic lever control of all scraper operations eliminates downtime and expense resulting from cable breakage. The cutting blade's four sections are interchangeable and reversible, providing straight and drop-center arrangements and longer blade life in any material.

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(*Continued from page 166*)

added it to the material to provide an optimum moisture content of about 13 per cent, the subgrade was compacted to 90 per cent of optimum. A Caterpillar No. 12 motor grader spread the material and a Southwest heavy-duty sheepsfoot roller and a Bros 50-ton pneumatic handled the compacting job.

To provide support for the pavement during frost-melting periods, 39 inches of 1-inch-minus select gravel, compacted to 100 per cent of optimum, and 6 inches of special crushed base material was laid in areas that were to be paved with 4-inch asphaltic concrete. The select base was increased to 45 inches under the taxiways. A 17-inch blanket of 1-inch-minus stone, which has a minus 200 mesh content of less than 7 per cent, was laid in areas wherever asphaltic paving was specified.

#### Difficult subbase work

Harris finished its work weeks ahead of schedule, making it possible for Northwestern to start one of its most difficult jobs at the field—the production and installation of gravel subbase to a finished tolerance of $\frac{3}{8}$-inch in 10 feet. Subbase material was obtained from the bottom of Porcupine Creek, about five miles from the airbase site.

A dragline worked during the cold months of 1955 to remove the material from the deposit and stockpile nearly 400,000 cubic yards of it for use in the manufacture of subbase, concrete, and hot-mix aggregates. A Kolman feeder hopper and loader, equipped with a small buzzer screen that scalped oversize rock back into the pit, also loaded the material into International 12-yard trucks that hauled to the large screening plant.

This plant, made for the project by Pioneer Engineering Works, Inc., produced subbase rock, and salvaged oversize material for use in the production of hot-mix aggregate. Two Caterpillar U-dozers and a Pioneer 36-inch mechanical feeder brought the rock to the 36-inch, 130-foot conveyor that elevated the material to a split feeder over a set of 6×14-foot Pioneer Mesabi-type vibrating screens. These were powered by electric motors driven by a separate General Motors diesel electric plant, but only the top deck was used. Oversize rock passed to a pair of 20-cubic-yard bins for storage, while subbase rock dropped through to a pair of 45-cubic-yard loading hoppers.

The 4,500 cubic yards of subbase turned out daily was hauled to runway and taxiway areas by a fleet of about 34 trucks. Ten of these were Ford T-800's with 15-cubic-yard trailer bodies. About 24 other trucks from 6 to 15 cubic yards in capacity—many of them rented—were also at work.

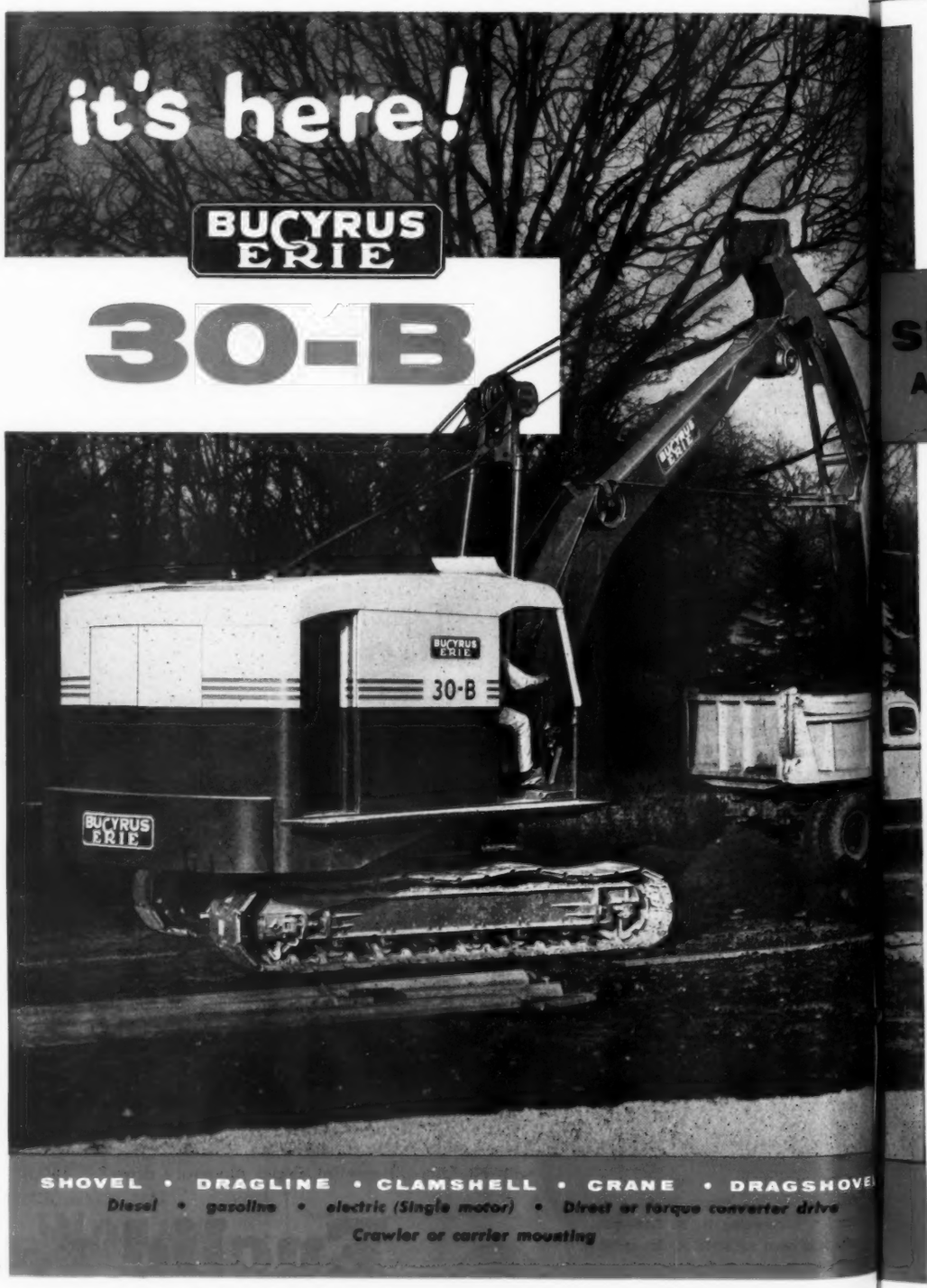
The trucks dumped to a Jersey spreader, mounted on a Cat tractor, and a Blaw-Knox spreader. The Blaw-Knox spreader was used to spread the final 6 inches of the crushed base course.

The bottom material was laid in loose lifts from 12 to 14 inches thick. A 20 to 25 per cent reduction in volume occurred as the stone was compacted in three passes by a Buffalo-Springfield Kompactor, followed by two passes by a Ferguson RT-100-S 50-ton pneumatic. This developed the required 100 per cent modified AASHO density.

When the last lift had been placed and rolled, a proof-rolling job was done in 30 passes by a 60-ton pneumatic-tire roller with tire pressures of 150 psi. Soft spots in the subgrade or subbase, brought out by this rolling, were replaced with sound material and tested again.

The finishing of this proof-rolled subbase was a difficult process. After being bladed to grade, the subbase was checked with straightedges and

Raw pit material for subbase, concrete, and hot-mix aggregates is dumped into trucks at the pit by a Kolman feeder hopper and loader. Fed by a dozer, the unit has a buzzer screen that scalps oversize back into the pit.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the surface skimmed with a special 27-foot drag-type blade. Pneumatic and steel-wheel rollers then worked the surface, and a "No Traffic" sign was posted while the base was primed with a coat of MC-0 oil before asphaltic concrete was laid.

#### Asphaltic concrete paving

The 64,000 tons of hot-mix aggregates—produced by crushing oversize from the subbase screening plant and blending it with 8 per cent of minus 80 blend sand from a pit south of the runway—had to have at least 75 per cent of particles with a 2-face fracture and a limited percentage of elongated or slivered particles. The crushing system consisted of a Cederapids Master Tandem, assisted by auxiliary jaw, rolls, and screening units interconnected by conveyors. Both the 1-inch-minus and the ¾-inch-minus aggregate, for the binder and surface courses, respectively, were hauled from the crushing plant and dumped in piles near the asphalt plant. The 100 to 120-penetration asphalt was transported some 90 miles from the refinery at Chinook, Mont., by truck.

The asphalt plant was a Barber-Greene Model 848, equipped with a No. 860 gradation unit so that an average of 110 tons of material could be turned out hourly. A 4-bin separation of aggregates was used, and both asphalt and rock heated so that the mix was laid at a temperature ranging from 265 to 275 degrees.

The 7-truck fleet of Fords, Chevrolets, and GMC's delivered the mix to two Barber-Greene pavers, which laid the 4-inch pavement in a 2½-inch binder course and a 1½-inch surface course. The machines operated about 600 feet apart so that no cold joints developed during a day's run. Joints formed at the end of a day's run were squared off and the longitudinal cold joints, formed between runs, were cut back about three inches.

Initial breakdown compaction is done by a Huber 3-wheel roller that carries three oil drums holding a supply of water for the rig. Both binder and surface course are compacted to the 98 per cent density required by the Marshall test.

A disk cutter mounted on a motor grader was used for this work. The disk cutter spalled the edge to some extent, but this did not affect the density of the cold joint.

A fleet of steel-wheel rollers developed the required density in both the binder and surface courses. Three Huber 3-wheel breakdown rollers worked close to the pavers, two Galion tandem Roll-O-Matics did some of the finish rolling, and a Buffalo-Springfield 3-axle tandem finished the job. The surface was checked continually with 10-foot straightedges during rolling. A small Tampo self-propelled roller was also on the job, chiefly to improve the texture of the surface by smoothing out pockets.

Northwestern is ready for an easier job now—subcontract work on streets at the airbase. The same plant and facilities used for airfield paving will be used on the street work, which does not have the rigid requirements of the airfield job.

U. S. Army Corps of Engineers operations at the base are under the general supervision of Col. Myron E. Page, Jr., district engineer at Walla Walla, Wash. He is assisted by Oliver A. Lewis, chief of operations and construction and Fred Sneddon, project coordinator. J. Fred Skidmore is project engineer in the field, assisted by Gordon Knott.

Northwestern Engineering Co. had its operations directed by G. W. Keener, project manager. Principal supervisors included Ray O'Meara, general superintendent; Alf Lundiy, office manager; Harry Woods, concrete; Fred Singleton, subbase; Roy McDuffee, asphalt; John Lutz, trucks; and Floyd Brammer, utilities.

THE END


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# Contract maintenance helps save New Mexico roadways

***Contractors take seal coating projects during busy summers; private, state forces each have advantages on maintenance work***

About 30 per cent of sealcoating work on New Mexico State Highways in a recent 12-month period was done by private contractors. This maintenance work accounted for 233 of the 700 miles of roadway that was sealed with asphalt and rock chips. The larger portion of the work was handled by state maintenance forces.

This practice on the state's 9,422-mile highway system has few drawbacks and a number of advantages for both contractors and the state. First of all, the bulk of this work is done during the summer months when state forces have plenty of work. Contractors are, in effect, aiding state crews on the maintenance work. With this additional help, the state is able to fix more miles of road than could be done with its maintenance forces alone. Then too, the state does not have to buy extra equipment that would be used only part of the time during the year; contractors use their own equipment for these jobs.

The maintenance work that can be put under contract is that which is clearly defined in plans and specifications. As a result, maintenance by contract is limited to the chip-sealing of bituminous highways; restoration or reconstruction of old bases and shoulders is still handled solely by state maintenance crews.

Contractors and state crews—which get along well under this system—each have their own advantages when it comes to doing the work. Contractors find it a little easier to tackle a job, since they have the latest in equipment and can get needed supplies without having to go through a lot of red tape, But state men—say engineers in charge—do better work largely because of the experience of the skilled men on the payroll. Some seal coat work done under contract has shown a tendency to bleed, particularly where the old surface was already a little fat.

### Large jobs programmed

One of the deciding factors in determining whether a job should be done under contract or by state forces is the length of the project. Officials found from a number of bids taken over the last several years that contract prices tend to be higher when jobs are short.

For this reason, projects put under contract are usually from 50 to 100 miles in length and have a central area that can be used as a base of operations by the contractor. The minimum-length contract—for 25 miles—was exceeded during the recent 12-month period by one firm that handled an 18.5-mile sealcoating project, combined with new construction in the same area. Both projects were advertised and let as one contract.

Bids for this work average $1,500 per mile, though a few of them have gone as high as $1,700 per mile when either the location has been bad or materials difficult to obtain. Most of these bids come from a group of contractors that includes Allison & Haney, Henry Thygesen, Inc., Wylie Bros. Contracting Co., all of Albuquerque; Harry Trotz Construction Co., Lovington; and Floyd Haake, Santa Fe. The Trotz firm, in particular, has been one of those concentrating on this maintenance work.

### Preparatory job

Before any contractor starts a seal coat project, preparatory work—small-scale widening, alignment


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For more facts, circle No. 590

MC-5 asphalt is applied to the chips by an Etnyre distributor. Between 0.15 gallon and 0.3 gallon is used per square yard, the amount used depending on the texture and condition of the old roadway.

changes, shoulder strengthening, and the addition of base course material wherever necessary—is done by one or more specialized crews working from one of the state's five district offices. These crews, working winter and summer, are equipped with motor graders, rollers, asphalt distributors, dump trucks, loaders, and various other equipment. Two Universal portable rock plants and three Cedarapids portable plants are also used by state maintenance forces for producing granular base-course material, chips, and mineral aggregates for some hot-mix work. The preparatory work is always completed at least 30 days before a contractor starts a sealcoating project. In this interval, the road carries enough traffic so that weak spots show up.

#### Different treatment

While the type of sealcoat used on state highways has varied, the department has standardized this work as much as possible. New Mexico has bituminous highways, many of them built by the road-mix method. Recent work has been with plant-mix. All these pavements will not stand up for much more than five years without sealcoating. On secondary roads, built by the stage construction method, repeated chip-sealing has been done to thicken the pavement.

MC-5 asphalt is almost always used with the rock chips, the amount used varying between 0.15-gallon and 0.3 gallon per square yard, depending on the condition and texture of the old mat.

Pavements built with hot-mix are usually sealed with ⅜-inch rock chips; in some cases, ½-inch and ⅝-inch chips are used. On dangerous hills and grades, and in areas where the pavement is to be made thicker, chips as large as ¾-inch have been used. Chips of this size are hard on automobile tires, but they provide excellent traction at sharp turns and on steep grades.

#### Innovation by contractor

An innovation that has proved popular with a number of contractors was made recently by one of the firms doing seal coat work. This contractor bought a Flaherty self-propelled chip spreader that has a receiving hopper large enough to take a full truck load of rock chips. A belt conveyor brings the stone from the hopper to the distribution point at the top of

*(Continued on next page)*


**KONKURE** Concrete Curing Compounds

Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications.

Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures* or rainfall damage.

*In hot, dry areas, use of Konkure White is especially recommended.

**GENERAL PURPOSE**

KONKURE Clear — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

KONKURE White — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

KONKURE Black — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

KONKURE Gray — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.

**TILT-UP and LIFT-SLAB**

KONKURE P. C. C. — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Special Manufacturers Price to Large Users

**KONKURE, INC.**

6742 Stanton Avenue, Buena Park, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 591



"all new MODERN design"

torque converter

2-speed transmission

HUBER WARCO

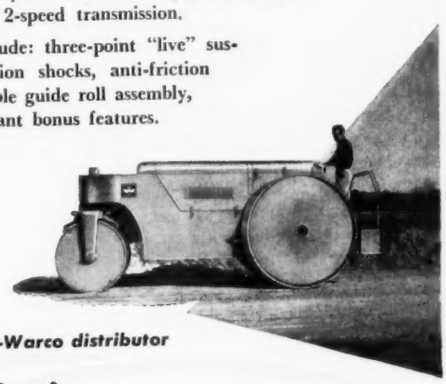
General Purpose • Finishing or Variable Weight

Huber-Warco's newly-designed 3-wheel roller is a powerful, rugged machine built for economy, performance and durability. Greater roller efficiency is achieved by the use of a torque converter, tail-shaft governor and 2-speed transmission.

Other important features include: three-point "live" suspension of the sub-frame to cushion shocks, anti-friction bearings throughout, completely adjustable guide roll assembly, dual braking systems, and many other important bonus features.

Huber-Warco 3-wheel roller can be supplied with variable weight rolls, or with cast iron rolls, in various sizes, for general purpose or finishing work.

See your Huber-Warco distributor for complete details. The Huber-Warco 3-wheel roller is the most modern, dependable roller you can buy.



*For a demonstration—see your nearest Huber-Warco distributor*

HUBER WARCO

Come see us...

1957 ROAD SHOW—BOOTH 714

On display—Motor Graders • Road Rollers • Maintainers

HUBER-WARCO CO., MARION, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 592

The Flaherty rig, stopped for a moment, has chips carried from hopper to distribution points at the rear by belt conveyor. A distribution and sizing screen spreads larger chips on the roadway first.

A GMC truck dumps a full load of chips to the Flaherty self-propelled chip spreader working on U. S. 85 south of Santa Fe.

*(Continued from preceding page)*

the machine. From here, the chips are spread across a distribution and sizing screen.

The front screen permits larger chips to reach the asphalt first and eliminate one of the most troublesome parts of this job. Since the larger rock particles go down into the asphalt where they bed well, there is no chance of stripping taking place. If any dust remains on the roadway, it can either be swept off by a power broom or blown off by traffic.

### State force developments

Innovations by contractors—like the chip spreader that proved so popular it was rented by other sealcoating contractors — have been outweighed by developments made by the state's maintenance crews.

In the Roswell area in the southwest corner of the state, for instance, crews have started to pre-coat all the rock chips turned out by portable plants. These chips are produced mostly from caliche, abundant in the section, which ranges from solid rock to soft calcareous formations. But even rock chips made from the harder caliche are highly absorptive and. sometimes, soft and friable.

The application of an MC-0 oil coat over the chips gives the crews several advantages. It tends to make the chips harder before they are put in storage. Then, when they are applied with MC-5 in a sealcoat, the chips stick in place readily; there is no stripping. The biggest advantage is that less cracking occurs in a roadway than would ordinarily be the case.

Rock production and pre-coating are usually handled in one operation. The chips coming off the end of the crusher's conveyor belt go to a pugmill and past a spraybar mechanism. Paddles coat the chips with MC-0 asphalt and blend the particles passing through the pugmill chamber.

### Compare production

The record shows that contractors speed work on their maintenance contracts as much—if not more—than on new construction. Only in a few cases have contractors needed the full amount of time allowed for their jobs.

Costs on the jobs are very low,


# How concrete-smashing PRY-ACTION BREAK-OU gets you jobs oth gs

**Contractor Leon Sumler, Jackson, Tennessee,** applies exclusive triple-power pry-action break-out with his TD-9 Four-In-One Skid-Shovel. And without delay, he breaks-up, and yanks-up an old filling station's concrete slab and footings!

**This new 3-yd. TD-18 Four-In-One Skid-Shovel** proved able to do as much as 3 power shovels and a dragline—excavating and loading up to 1,700 lineal feet of old concrete pavement daily—operating for Henry E. Berghuis, Prinsberg, Minn.

**Street-widening and regrading calls** for removing old concrete pavement—which the new TD-9 Skid-Shovel is loading out at 600 cu yds per day! Dennis Widmer, Portland, Oregon, owns this outfit with the job-getting break-out power!

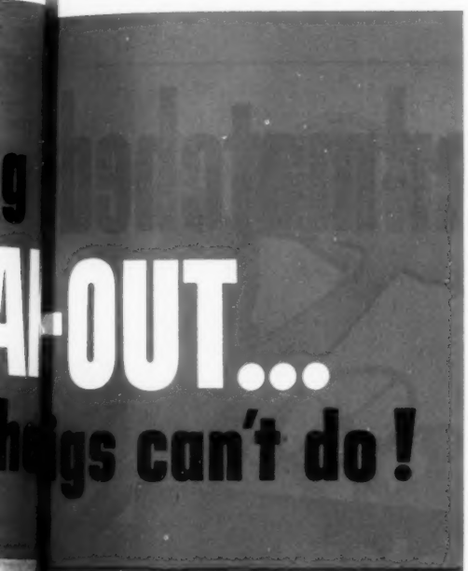
since the projects have been conceived by district engineers, reviewed and approved by the main office at Santa Fe, and assigned to a project engineer at field level during the contract stage. A project engineer may either handle several such jobs or a contract maintenance project and new construction work in combination.

#### Top-notch maintenance patrol

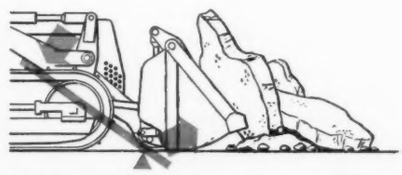
Whenever New Mexico sealcoating work is mentioned, one maintenance patrol comes in for special commendation. This crew consists of five Navajo Indians, working on the department payroll, which have route 666 patrol running for most of the lonely distance between Gallup and Shiprock.

Sealcoats put down by this crew have stood up a year or two longer than expected, and the men work so fast on patching that roller operators have a hard time keeping up. A few winters ago, when severe storms hit the area, the crew worked extremely fast with patching trucks to repair breaks in the roadway. And though engineers felt that the road would have to be reconstructed the following summer, the Navajos had done the work so well that the highway is still in a fairly good condition despite its age and the numerous patches.

Under its current system of doing seal coat work with state and private forces, New Mexico is getting additional years of life from a road system that would otherwise have been made obsolete by modern traffic. The practice of using state forces for jobs which they alone can handle, and contractors—with their equipment pools—for bigger and more standardized maintenance, has proved itself advantageous. Both types of crews have dovetailed their operations so well that the state can claim a whole group of private contractors as one of its more important maintenance forces. THE END

**Thirty-six times as fast** as 3 men and a jack-hammer ld do it—this TD-14 *broke-up, dug-out, and loaded* 180 lineal of old one-by-four-foot concrete wall, in only 4 hours! Owner: erson Trucking and Excavating, Inc. Buffalo, N. Y.



Pry-action break-out force ranges from 12,000 lbs. on the International Drott TD-6 Four-In-One Skid-Shovel—to 27,000 lbs. on the TD-18 model. For special applications like land-clearing, the TD-18 model can be equipped with larger hydraulic cylinders to develop 54,000 lbs. of break-out!

Patented and exclusive International Drott pry-over-shoe break-out action gives you *up to six times as much excavating power* as ordinary front-end loaders can deliver! Only an International Drott gives you this multiplied force of the scientific lever principle acting over big skid-shoes, and teamed with ground-level bucket roll-back. *No other loader even has skid-shoes!*

Only International Drott-developed reverse cylinder action produces the tremendous hydraulic power for pry-action break-out. And this pry-action principle shunts shock-stresses directly into the ground—so they can't maul loader or tractor.

*Measure the job-getting, capacity-adding advantages* of exclusive triple-power, pry-action break-out. Note how exclusive parallelogram raise action keeps the bucket level, all the way up—reduces spillage—increases your daily yardage up to 18%! Prove that exclusive, shock-swallowing Hydro-Spring protects equipment, adds operator comfort. And try the exclusive International Drott Four-In-One that *gives you four-machine utility* for one moderate investment—in your choice of four sizes, one-yard to three-yard capacity. See your International Drott Construction Equipment Distributor for a demonstration.

**A tough oak tree with 22-inch trunk** is uprooted with the tremendous pry-action break-out—applied by TD-14 using grubber blade attachment, instead of bucket. Owner Lester H. Davis, Bennington, Vermont, is clearing farm land.

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®


## Stud gun can be used without any attachments

■ A new type of stud gun, designed for operation by the various building trades in their different applications without the use of any attachments, is announced by the Le Belier Stud Gun Corp. The new tool also has several built-in safety features.

The holding of disks, pipe straps, and other pieces to be fastened is accomplished by a patented Le Belier disk-hold system. This feature was engineered into the tool, the manufacturer states, to eliminate the necessity of attachments. Among the safety devices is one that makes it impossible for the charge to be exploded if the tool is not perfectly perpendicular to the work surface.

According to the manufacturer, safe and secure fastenings into wood, steel, or concrete can be made in as little as 15 seconds. The proper selection of powder charges permits all types of work—steel to steel, steel to concrete, wood to steel, or wood to concrete.

For further information write to the Le Belier Stud Gun Corp., Mercantile National Bank Bldg., Miami Beach, Fla., or use the Request Card at page 18. Circle No. 220.

## Power steering gear fits line of road maintainers

■ A full-time power steering gear that can be installed on any current model Huber-Warco maintainer is available from R. H. Sheppard Co., Inc. The gear, a completely integral unit, is offered in kit form. The kit includes everything necessary to make the installation.

According to the company, installation requires the drilling of five holes and the enlarging of the pilot hole of the maintainer's mechanical gear. There are only two hydraulic lines to connect—a pressure and a discharge line. A flo-divider valve is used with the standard Huber-Warco hydraulic system to operate the Sheppard unit.

For further information write to R. H. Sheppard Co., Inc., 47 Middle St., Hanover, Pa., or use the Request Card at page 18. Circle No. 218.

## Section of Florida Parkway officially open to traffic

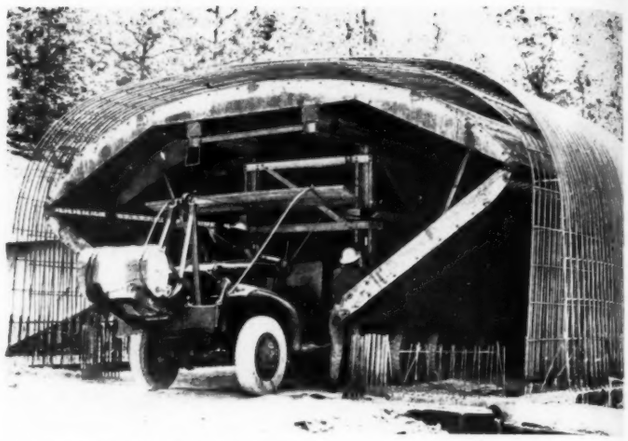
Official opening of the Miami-Fort Pierce section of Florida's Sunshine State Parkway is scheduled for the 25th of this month.

This 110-mile section of the parkway has entry-exit points at Golden Glades in North Miami and at Fort Pierce, and in addition there are eight interchanges where motorists may enter or leave. Three service areas are included in the design.

Work on the project started July 24, 1955. The final cost is estimated at $62,000,000, which will be covered by turnpike revenues.

←For more facts, circle No. 593

# Hinged and triangular forms ease work on new ammunition storage units



The hinged forms for the inner walls, designed and fabricated by Blaw-Knox, are moved into position on an Army 6×6 truck.

There may be nothing new under the sun but there is something new in Alabama, where the U. S. Army has built 478 yurts.

These structural huts, used by the nomadic tribes of Central Asia, are traditionally built of skins or felt stretched across a lattice framework. But for the 487 yurts being used as ammunition magazines at the Anniston Ordnance Depot, Anniston, Ala., the Army abandoned all but the shape of the huts, constructing them of reinforced concrete placed in special steel forms.

Unlike ammunition storage igloos, which have sides sloping toward the center from ground level, the yurts are rectangular in shape and have side walls rising vertically for 8 feet before curving into an arch roof. As a result, a yurt covering the same floor area as an igloo has greater storage capacity and is better able to accommodate material handling equipment such as overhead cranes or traveling gin poles.

### Hinged forms

The yurts built at the Anniston Ordnance Depot measure 25×80 feet and have 8-foot-high side walls with vertical inner faces and battered outside faces. The elliptical barrel-arch roof of each structure has a clear span of 25 feet and an intrados rise of 6 feet. The clear height at the crown is 14 feet. Two of these structures were built daily by Coosa Contractors, a joint venture, which used four sets of special inside wall forms and three sets of headwall and outside forms.

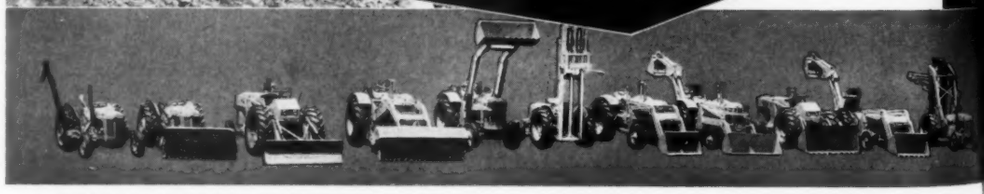
After the base reinforcing had been installed for a structure, the floor pad poured, and the foundation footers poured around tie rods that were welded to the steel reinforcing for the walls and arch, the steel forms were set in place. These forms, designed and fabricated for this job by Blaw-Knox's Steel Forms Department, Pittsburgh, Pa., consisted of a form for the inner wall in four hinged sections and outside form panels, 12 feet high and 20 feet long.

The inner form, set first, was transported into position by a truck, and removal of the forms was handled by the same rig. Conventional hydraulic jacks and ratchets on each section made it possible for the form to be adjusted for crown height and side-wall spread.

Outer side-wall forms and the rear-wall forms were set in position by a

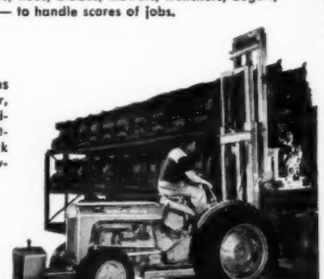

Versatile, power-matched

5 tractors
(34 to 52 hp)
20 attachments



TRACTORS, ATTACHMENTS — DESIGNED FOR EACH OTHER! Here's the first family of machines in this work range built to construction standards with integrated design of both tractors and attachments. Five tractors (34 to 52 hp) with choice of 20 attachments — loaders, hoes, blades, mowers, trenchers, augers, fork lifts, and others — to handle scores of jobs.

WORK BULL MODEL 303 has 42-hp gas or diesel engine. With ⅝-yard loader, it pays off on scores of backfilling, loading and stockpiling jobs. Other front-mounted attachments: Angle dozer, fork lift, utility boom, scarifier, sweeper. Powerful hydraulic backhoe.



42-HP DAVIS PIT BULL handles either ⅝ or ⅞-yd buckets. Frequently outperforms bigger, more costly shovel-loaders because of overall advanced design, which includes torque converter and "foot-shift" reversing clutches as standard equipment.

LOW-COST, VERSATILE Model 202 Fork Lift loads equipment and machinery, stockpiles building materials, also handles blade or utility bucket. Economical-to-operate 34-hp engine makes it great for utility and cleanup on big spreads . . . ideal for small, scattered, work-and-run jobs.

crane. These forms had steel spacers located at the start of the crown so that proper spacing was maintained between the forms during a pour. Screed rails were spaced on 10-foot centers so that the crown could be struck off.

When concrete had set up enough to allow these forms to be stripped, the forms for the front wall of the structure were set. This wall, triangular in shape, acts as a retaining wall for the earth blanket that covers the sides and back of the magazine. This earth cover is 2 feet thick at the crown and has slopes of 2 to 1 at both sides and the rear.

**Personnel**

This new type of ammunition cache, equipped with gravity ventilation and protection against lightning, was built under the direction of Col. Harold E. Bisbort, district engineer. Instrumental in adapting the yurt for Army use was Earle B. Stradley, an ordnance employee in the Operations Branch of the Field Service Division. The architectural-engineering firm responsible for the design of the structures was Black & Veatch, Kansas City, Mo. Construction was done by Coosa Contractors, a joint-venture of M. T. Reed Construction Co.; Contractors Material Co., Inc.; and Taylor-Wheless Co., all of Jackson, Miss.; and Ruby Construction, Madisonville, Ky. J. M. Field was project manager.

THE END

The triangular shape of the front-wall form provides the building with retaining wings that will hold the earth blanket covering the 25×80-foot yurt.

## Ball-pivot assembly supports weighing bin

■ A ball-pivot assembly used to support one or more points of a tank or bin in the hydraulic weighing system manufactured by the company has been announced by The A. H. Emery Co. In operation, the pivot assembly helps support the tank but allows free motion of the structure so that active load cells can pick up an equitable portion of the load.

The Emery EC weighing system converts force into hydraulic pressure. This pressure actuates an indicator, recorder, or controller. The system is recommended for bin, tank, platform, and conveyor weighing applications.

The pivot assembly is used in tank and bin weighing applications where it is unnecessary to support the load with load cells at every point. In such applications, one or more pivot assemblies are used in conjunction with one or more load cells.

For further information write to The A. H. Emery Co., Pine St., New Canaan, Conn., or use the Request Card at page 18. Circle No. 219.

## J. A. Volpe expedites secondary road program

The interim Federal Highway Administrator, John A. Volpe, has delegated to field offices of the Bureau of Public Roads the authority to approve projects proposed by the states for construction on the federal-aid secondary road system. It is hoped that this step will relieve the Washington, D. C., office of the Bureau of Public Roads of many detailed decisions.

The delegation gives the division engineers of the Bureau the authority to accept or approve all programs of projects submitted by the states that involve immediate or future participation in federal-aid secondary funds and all revisions of the projects in that category.

Under the plan a state may request the transfer of much of the engineering and administrative responsibility for secondary roads to the state highway department. This is subject to blanket approval and acceptance of the state's certification for each project that the previously approved general standards and procedures have been followed. All requests are to be approved by the Secretary of Commerce.


packages!

**52-HP WORK BULL MODEL 404** mounts ⅝-yd front-end loader plus powerful hydraulic backhoe. Loader, fork lift and other front-end attachments operate off same hydraulic arms. As with all Work Bulls, attachment switches take only 5 to 15 minutes.

***New M-H-F Work Bulls pay off . . . as primary equipment . . . as backup machines . . . as utility or cleanup tools***

**Versatile Work Bulls** — with a choice of 20 easily interchangeable, *switch-in-a-smoke-break* attachments — offer a great two-fold opportunity to increase earnings. You put more work on a paying power basis. And you get more effective application of your present crawler or rubber-tired digging, loading and maintenance equipment.

**Pay off on every project**

**On small, scattered assignments,** Work Bulls earn a handsome profit . . . mechanize hand labor . . . hustle over-the-road or cross-country from site to site.

**On medium-sized layouts,** Work Bulls team with larger, single-purpose equipment . . . keep equipment costs in line with the job and simplify equipment scheduling.

**On big spreads,** Work Bulls take over maintenance and cleanup duties . . . allow scrapers, dozers, shovels and other big rigs to concentrate on work they can handle most profitably.

See how a relatively minor investment can *pay off in big profits.* Write for free catalog and the name of your retail distributor.

***One source, one responsibility for sales and service on both tractors and attachments***

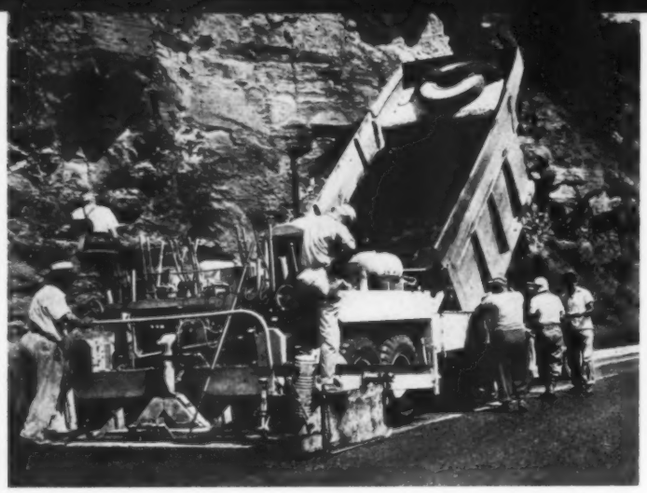
M-H-F WORK BULLS

DIVISION OF MASSEY-HARRIS-FERGUSON, INC.

12-A Quality Avenue Racine, Wisconsin

For more facts, use Reader-Reply Card opposite page 18 and circle No. 594

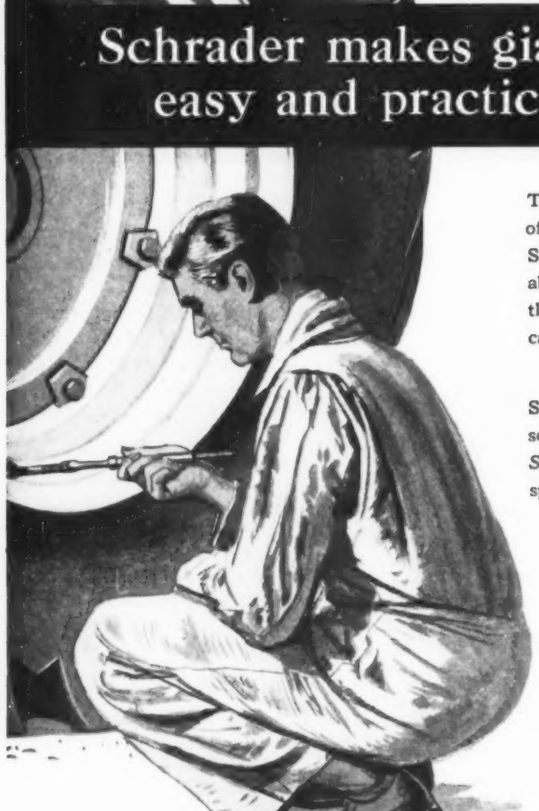
## Construction camera



**Winding around** a rock face in the mountainous area of Pennsylvania's Allegheny County, a Blaw-Knox PF-90 paver-finisher receives a load of asphaltic concrete from a haul truck. This is a half-mile resurfacing job on the Glassport-Elizabeth road, under the supervision of the Pennsylvania Highway Department.

**A 4-foot-thick section** of end wall is removed from the Los Angeles Metropolitan Water District pumping plant at Gene, Calif., by a Lorain Moto-Crane with 50-foot boom, in preparation for a plant addition. The end wall, was removed in sections weighing up to 10 tons each.

Schrader makes giant tire service easy and practical anywhere



There's an easy answer—and Schrader has it—to off-the-road tire pressure and valve maintenance. Schrader has *all* the answers to your questions about Large Bore tire valve service. Information that is up-to-the-minute. Reliable. Easy to get, because we have the answers ready. It's our business.

For *all* tire gauges, valves and tools, the name Schrader has always meant top quality, and top service. Wherever you use air, you can rely on *Schrader* when you need service or facts. Always specify Schrader Products by brand name.

Schrader Products
from the famous Large Bore Line

Schrader Large Bore Valve Caps and Cores

A. SCHRADER'S SON
*Division of Scovill Manufacturing Company, Incorporated*
470 Vanderbilt Avenue, Brooklyn 38, N. Y.

Schrader®
ESTABLISHED IN 1844

FIRST NAME IN TIRE VALVES
FOR ORIGINAL EQUIPMENT AND REPLACEMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 595


### Construction contracts covered in three books

The Fordham Law Review, a quarterly publication of The Fordham University School of Law, New York, N. Y., has published articles on government construction contracts in several recent issues. Volume 24, No. 4 (Winter, 1955–56) contained three articles on this subject, entitled "Contract Procedures for Obtaining Additional Compensation", "Extra Work", and "Changed Conditions and Misrepresentation of Subsurface Materials"; Volume 25, No. 1 (Spring, 1956) included articles entitled "Principles Applicable to Mistakes in Bids on Federal Construction Contracts" and "The Disputes Clause in Government Contracts: A Survey of Court and Administrative Decisions"; and Volume 25, No. 2 (Summer, 1956) published "Surety Bonds on Federal Construction Contracts: Current Decisions Reviewed" and "The Interpretation of Government Contracts: A Plea for Better Understanding."

Among the articles on the same


**BATTERY AD-X2***
**ADDITIVE**
**available to contractors after 7 years' testing in large industrial accounts**

A California plywood manufacturer says: "We saved $4,095 initially by **AD-X2** treating our batteries."

A Kansas transportation company says: "We cut our battery costs by 60% for the past four years by treating with **AD-X2.**"

A California police radio engineer after 7 years' experience: "If new batteries are treated with Battery **AD-X2**, the life expectancy will be extended two and a half times the normal life."

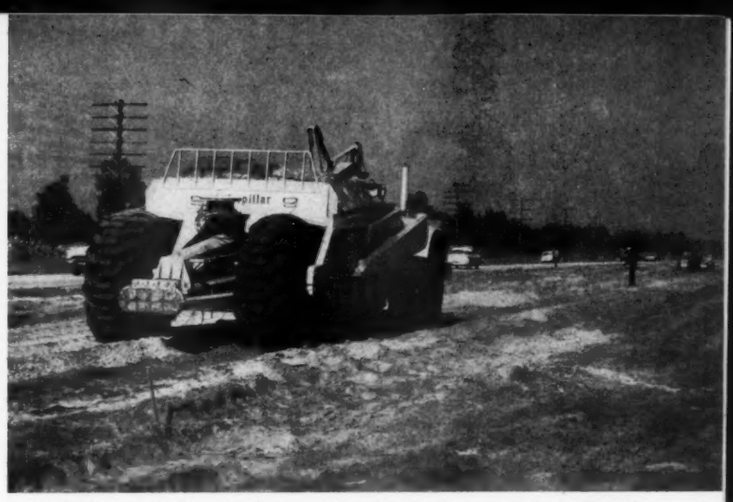
Pennsylvania contractor: "We have used and sold 25,800 treatments of Battery **AD-X2** since 1951. Our batteries last 2 to 3 times longer with **AD-X2** than without."

**TREATMENT: AUTOMOTIVE BATTERY, 6 VOLT or 12 VOLT . . . $3.00**
**$27.00 PER DOZEN — $3 May Save You $30.90! ORDER NOW**

**Treatment Good for Life of Battery. Easy to Apply.** Do It Yourself. Like pouring sugar in coffee. Some territory open — local dealers wanted.
JESS M. RITCHIE, President
**PIONEERS, INC.**
**2411 Grove Street, Oakland 12, California**
**TWinoaks 3-6044**
*Registered, 'U.S. Patent' Office

For more facts, circle No. 596

**Uphill loading** is done in a borrow pit near the route of a modern highway near Jonesville, La., by a Euclid twin-powered TS-18 scraper assisted by a Cat D9. Some 3,100,000 yards of earthwork in the Catahoula swamp area is involved in this job, which is being done by Hyde Construction Co., Jackson, Miss.



**Limerock base material** is spread on a section of U. S. 1 between Jacksonville and St. Augustine, Fla., under a program that will make the road a 4-lane boulevard by the end of 1957. This Caterpillar scraper was one of several used on the 370,000-yard grading job in this 15-mile section.

subject which will be published in future issues of the review are: "Delays in Government Construction Contracts", Damages in Government Construction Contracts", and "Progress Payments in Government Construction Contracts."

Copies of the Review may be obtained from Fordham Law Review, Fordham University School of Law, 302 Broadway, New York 7, N. Y. Back issues are available for $1.00 per copy; a subscription for a volume of four issues is $3.50.

### Partnership announced

Slaughter, Saville & Blackburn, industrial engineering consultants of Richmond, Va., and Brown & Blauvelt, civil engineering firm of New York, N. Y., have announced the formation of the professional partnership of Blackburn, Brown & Blauvelt, of Richmond. The new partnership will combine the industrial services offered by Slaughter, Saville & Blackburn with the civil engineering services of Brown and Blauvelt.

**"Is it too late, Doctor?"**

It's *not* too late for Americans who go to their doctors at the *first sign* of any one of cancer's 7 danger signals: (1) any sore that does not heal (2) a lump or thickening, in the breast or elsewhere (3) unusual bleeding or discharge (4) any change in a wart or mole (5) persistent indigestion or difficulty in swallowing (6) persistent hoarseness or cough (7) any change in normal bowel habits.

Guard yourself against cancer. Phone the nearest office of the American Cancer Society or simply write to "Cancer."

*American Cancer Society*

For more facts, circle No. 597

*Something NEW in diamond blades!*

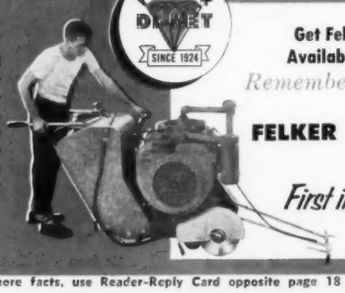
THE FELKER *di-lock*

*cuts 26% to 70% more footage in concrete!*

**That's a fact.** First tests show Felker DI-LOCKS are out-cutting other standard diamond blades by as much as 26 to 70% in 24 to 48 hour, highly siliceous concrete!

Felker DI-LOCKS are the result of an intensive research program, greatly enlarged facilities and a *totally new manufacturing technique!* The DI-LOCK process locks the diamonds in the rim by utilizing a new combination of chemical and furnace techniques. This process literally coats the new alloy around each individual diamond particle. The rim is denser, sounder . . . totally free of coarse granules, minute gas pockets, voids and other microscopic defects which may limit diamond blade life by weakening the grip on the diamonds! DI-LOCK grips tighter . . . lasts longer!

**FEATURED IN BOOTHS 93 AND 94, A.E.D. CONDEX, CHICAGO, JAN. 27-'57**



**MODEL 364 FELKER CONCRETE CUTTER**—The ultimate in a powerful, heavy duty machine for production cutting. New positive, no-slip cog-belt type spindle drive puts all the engine h.p. at the blade. New hydraulic variable speed power drive. Many other features and models available!

FELKER DI-MET SINCE 1924

**Get Felker DI-LOCK Diamond Blades. Available from all Felker Distributors.**

*Remember, Felker means Footage!*

**FELKER MANUFACTURING CO.**
Torrance, California

*First in Diamond Cut-Off Blades!*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 598

## Construction camera

**Silt and blasted rock** is scooped from the bed of Green River, Kentucky, by a Manitowoc 4500 dragline during widening and deepening work that will enable the stream to accommodate deep-draft coal barges. The dragline makes up to 92 passes an hour on this 450,000-yard job.

**Curved walls,** large pilasters, and stepped footings complicate the work of enlarging the St. Scholastica School, Chicago, Ill. More than 17,500 square feet of Symons forms are used for the 18 to 20-inch-thick and 9 to 10-foot-high walls of the 190×190-foot fine arts building.

### Truck-mounted crane requires little space

■ A truck-mounted crane that uses only 22 inches of space between the truck cab and the bed is announced by Teale & Co. The Versa-Lift Model 400 mounts on any truck from 1½ tons. It converts the truck to a self-loader without any appreciable sacrifice in load capacity.

Requiring only the truck operator for loading and unloading, the Versa-Lift can handle up to 3,500 pounds with a 16-foot boom and up to 7,000 pounds with an 8-foot boom. It swings in a complete 360-degree circle and has a minimum load clearance of 6 feet when the boom is horizontal.

Completely hydraulic, the unit is powered through the truck's power takeoff. A cushion-valve protects the rig if the load is dropped and caught. A hydraulic "limits" system guards against damage from overloading. Hydraulically extended outriggers protect the truck frame and add stability.

For further information write to Teale & Co., P. O. Box 308, Omaha 2, Neb., or use the Request Card at page 18. Circle No. 256.

### Tongue-and-groove joint designed for thick slabs

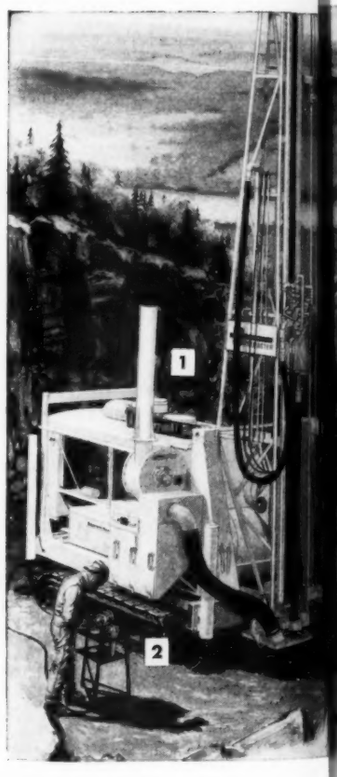
■ A new tongue-and-groove nonmetallic joint designed for use in slabs ranging from 14 to 20 inches in thickness is announced by the Presstite-Keystone Engineering Products Co. The Kapco joint has a larger key —1¼ inches deep, 4½ inches wide at the base, and 3½ inches wide at the top—than standard joints used in 8 to 10-inch-thick concrete pavements.

Construction of the joint, which has primary application in airport construction, consists of strips of mastic board about ⅛ inch thick with outside liners of asphalt-saturated heavy kraft. The joint is preformed to provide a tongue-and-groove design of maximum efficiency. The joint material is pre-punched to accommodate steel dowels and stake pins.

For further information write to the Presstite-Keystone Engineering Products Co., 101 E. Ontario St., Chicago 11, Ill., or use the Request Card at page 18. Circle No. 265.


# How IR Equipment fits into the High

*. . . helping to meet contract dates every bit of the way*




1 **DRILLMASTER** – Completely self-contained, self-propelled blast-hole rig for rotary or percussion drilling with the advanced design "down-the-hole" drill.

2 **BIT GRINDER** – Air-powered hand grinding unit and stand for fast, on-the-spot resharpening of large-size Carset Jackbits.

3 **WAGON DRILLS** – Provide complete flexibility for fast, efficient drilling in any position. Easily moved about by hand or with air hoists mounted on the unit.

4 **JACKHAMERS** – A complete line of hand-held drills with the right combination of weight and power for secondary drilling jobs.

5 **GYRO-FLO PORTABLE COMPRESSORS** – Smooth-running, dependable, virtually maintenance-free rotary air compressors in sizes from 85 to 900 cfm.

6 **CRAWL-IR** – Completely new, self-propelled, air-powered, crawler-mounted drill, with hydraulic or manual control of drill tower tilt and swing.

7 **HYDRA-BOOMS** -Gyro-Flo powered and mounted on a truck or tractor, they speed multiple hole drilling at any angle.

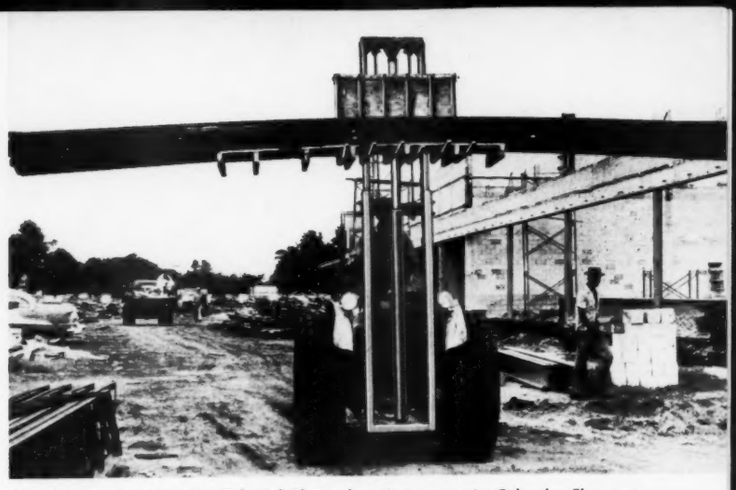
8 **QUARRYMASTER** – The larger completely self-contained and self-propelled blast-hole drilling rig for drilling large diameter holes with "down-the-hole" drill.

9 **FORM-PIN DRIVERS** -Standard I-R Paving Breakers with special front-heads, drive pins as fast as you can set them.

10 **DUAL-DRILL RIG** – Specially designed for simultaneous two-hole drilling in trench work.

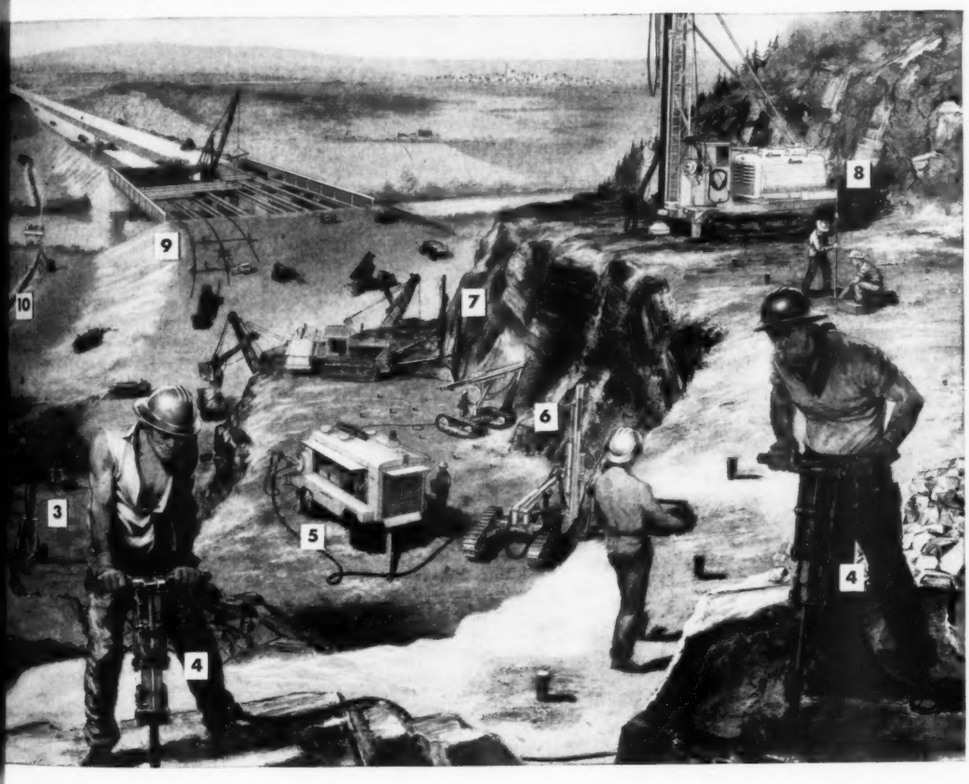
OTHER I-R EQUIPMENT FOR ROAD BUILDING

**At a steep grade** on the Vall Mountain section of the Pacific Northwest Pipeline, International TD-18 crawlers use a Carco winch to hold a welding truck working on the 26-inch line. This 65-mile section in Washington is one of the toughest on the 1,487-mile natural gas line from the southwest.



**Steel joists** going into the Colonial Plaza shopping center in Orlando, Fla., are handled easily at the site by a Sherman fork lift. The contractor on the new structure also used the equipment to unload masonry blocks from trucks and deliver them to workmen on scaffolds.


# Highway Construction Picture




FROM big rock cuts to form-pin driving and backfill tamping, Ingersoll-Rand air power equipment plays a leading role in modern highway construction.

The first and biggest job on many sections is to *get out the rock* — and that's where the complete I-R line of rock drills and compressors can speed up the work every bit of the way.

On tunnel jobs, too, as well as in ditching and pipelining, specialized I-R drilling equipment saves time, effort and expense — helps you keep to schedule all along the line.

Work-saving air tools cut costs on bridge and structural steelwork, on wood forms and shoring, concrete vibrating and literally hundreds of jobs where operator fatigue can be reduced by use of low-cost Ingersoll-Rand air power.

Shown here are the major items of Ingersoll-Rand equipment for modern highway construction — all designed and built to work together as a time-saving, cost-saving *Contractors' Combination*. For the complete story, be sure to see the Ingersoll-Rand exhibit, Booth No. 712 at the Road Show — or write for your copy of Bulletin No. 202D.

CONTRACTORS' COMBINATION

14-474

BUILD BETTER ROADS TODAY · FOR A GREATER AMERICA

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

AMERICAN ROAD BUILDERS ASSOCIATION

**Ingersoll-Rand**

11 Broadway, New York 4, N.Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 599


## Vibration roller permits wide range of adjustment

■ A self-propelled vibration roller that is adjustable from 4 to 18 tons rolling effect is available from the Combined Agencies Corp., U. S. representative for the West German manufacturer, Allgemeine Maschinen-Gesellschaft. The Model SW is an 18-hp rig that weighs 7,000 pounds and operates at speeds up to 2.6 mph.

The unit is powered by a Deutz diesel engine. It can negotiate a 25-degree grade, making it possible to truck-load itself. Steering is hydraulic through the front roller. According to the manufacturer, the Model SW has a penetration of 20 inches.

Other selfpropelled models have rolling effects of from 5 to 15, 6 to 12, and 6 to 16 tons. A towed model covers requirements in the 11 to 25-ton range.

For further information write to the Combined Agencies Corp., Suite 812, Barr Bldg., 910 17th. St., Washington 6, D. C., or use the Request Card at page 18. Circle No. 257.

## Encyclopedia published on iron and steel

A new reference book, "An Encyclopedia of the Iron & Steel Industry", compiled by A. K. Osborn, has been published by the Philosophical Library, Inc. The purpose of the book is to provide of concise description of the materials, plants, tools, and processes used in the iron and steel industry, and in those industries closely related to it. The book also defines the technical terms employed.

The book, not intended as a text, should prove helpful to small firms, which do not maintain a library of their own. Full page photographs illustrate the definitions. The subjects cover the ore down to the finished product. The volume represents material collected over more than a quarter of a century.

In addition to the encyclopedia proper, the book contains five appendices, a section on new processes and supplementary data, references, and a bibliography. Priced at $25, it is available from the Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y.

## Construction camera

**In the wilderness** of the Presque Isle Peninsula, off Erie, Pa., a Bucyrus-Erie 22-B backhoe clears a vast lowland area for a multimillion dollar recreation project. The area being cleared by C. L. Herman, Erie, subcontractor on the project, will provide sand for beaches in the area. A GM Detroit diesel powers the rig.

**A 2½-inch topping** of asphaltic concrete for the road from the Han River Bridge to the capitol building in Seoul, South Korea, is compacted by a Huber-Warco 5 to 8-ton tandem roller, purchased with U. S. aid funds. The road is for trucks with a load of 12,000 pounds on each dual wheel.

### HRB text covers chemical, mechanical stabilization

"Chemical and Mechanical Stabilization," a bulletin released by the Highway Research Board, contains eight papers on the phases of soil stabilization by chemical and mechanical means.

The topics covered in the bulletin include the design and construction of base courses; organic cationic chemicals as stabilizing agents for Iowa loess; additives as aids to asphalt stabilization of fine-grained soils; and the application of mechanical stabilization to an Arctic beach.

Remaining papers discuss the stabilization of fine and coarse-grained soils with lime-fly ash admixtures; field evaluation of lime-fly ash soil compositions for roads; soil stabilization with lime-fly ash mixtures; and the special factors in lime stabilization. The bulletin is well illustrated with charts, graphs, tables, and job photos.

Priced at $2.25, Bulletin 129 is available from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

### Lindsey, Carter form new engineering firm

Archie N. Carter and James A. Lindsey, Jr., have established the land surveying and consulting engineering firm of Lindsey, Carter & Associates, Inc., in Excelsior, Minn. The firm will specialize in the planning and design of highways, drainage, water supply, sewerage, and other municipal facilities.

For the past three years, Lindsey has been president of the Lindsey Engineering Co. of Excelsior. A civil engineering graduate of the University of Minnesota, he has worked with the Minnesota State Highway Department, the U. S. Bureau of Reclamation, and the Civil Engineers Corps of the U. S. Navy.

Carter has been manager of the highway contractor's division of the Associated General Contractors for the past nine years. A civil engineer, he served with the U. S. Army Corps of Engineers and has worked in Liberia, West Africa, building highways on the Firestone plantation.


# 27 Seaman-Andwall Trav-L-Plan Achie

## Uniformity in AASHO Sub-Bas Stabi

### Global interest shown as AASHO sets construction patte for nat

Highway officials, engineers and contractors from all parts of the world have been watching the most rigidly controlled road construction experiment ever attempted. AASHO engineers demanded undeviating uniformity in the sub-base of every test section. All equipment had to prove its performance beyond question before acceptance. And all equipment had to be absolutely identical. After competitive test with other mixers, Seaman TRAV-L-PLANTS were selected to do the mixing, the blending of soil particles to attain the specified 95% densities and to bring the moisture content of the fill to optimum. 27 TRAV-L-PLANTS, all equipped with pumping equipment, volumetric meters, spray bars, underbody scarifiers and power steering kept the moisture increment within the tight 2% tolerance demanded.

The stiff clay used in the sub-base stabilization made the job of fast, uniform mixing impossible in the initial experiments made with other equipment. The SEAMAN-ANDWALL TRAV-L-PLANT, on the other hand, demonstrated great superiority in the attainment of the exacting uniformity.

Each TRAV-L-PLANT towed its own water supply because tank trucks were not allowed on grade. 1000 gallon wheel mounted tanks were attached

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Illinois.

## AASHO TESTS PATTERN FUTURE HIGHWAY METHODS

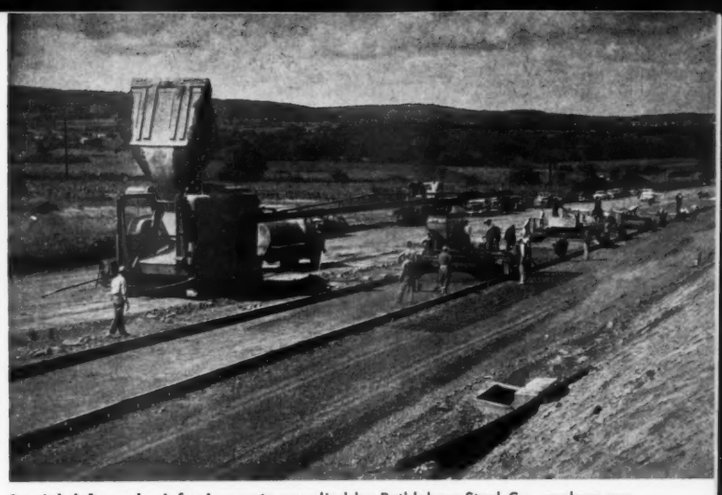
Sub-grade stabilization, once the most neglected phase of modern highway construction, has come of age. The most recent proof of this comes from LaSalle, Illinois, center of the most ambitious experimental highway construction programs in the nation's history. The American Association of State Highway Officials; all 48 states; the territories of Hawaii, Puerto Rico and the District of Columbia and the Highway Research Board are participating in the construction of this significant test facility. The AASHO test road will be in the nations road building spotlight for many years to come. The painstaking control exercised by AASHO engineers; the precision and perfection of new road building methods and the high speed equipment that was used, will certainly be studied and specified on many thousands of miles of new construction. The techniques and operations adopted at the AASHO test road may well become standard operating procedure on all roads of the future.

SEE THE ROAD SHOW

S-A

BE SURE TO SEE THE SEAMAN-ANDWALL EXHIBIT
AT THE ROAD SHOW, SECTION A, BOOTHS 320 AND 323

**One of the series** of retaining walls forming terraces on the Air-Force Academy which will be built near Colorado Springs, Colo., is poured by an Econmobile with a hydraulically operated bucket. The rig is being used on walls up to 22 feet high, which Long Construction Co., Inc., Denver, is building with Symons forms.



**Special deformed reinforcing mats,** supplied by Bethlehem Steel Co., replace contraction and expansion joints and standard reinforcing on a 2-mile stretch of U. S. 111 near York, Pa. As the Rex paver dumps concrete, the material is struck off to a 4½-inch depth and the mats laid. Another 4½-inch lift is added later.

# Achieve Unparalleled Stabilization Tests

## for nation's highway program

at the side of the TRAV-L-PLANTS by an outrigger device.

SEAMAN-ANDWALL TRAV-L-PLANTS through their superiority established in the gigantic AASHO experiment have again won recognition and approval as standard equipment in base and sub-base stabilization in the National Highway Program.

Successful bidders for the sub-grade work were the S. J. Groves and Sons, Co. of Minneapolis and the Arcole Midwest Construction Co. of Skokie, Illinois.

A caravan of four TRAV-L-PLANTS on the straightaway of the AASHO test road. It is high production like this that completes the sub-base stabilization work on time. A total of 27 such units were on the job.

The Seaman-Andwall TRAV-L-PLANT with special outrigger water supply tank on a super-elevated "turn-around" of the AASHO test road. Note the outrigger wheel and novel hitch arrangement. No standard water trucks were permitted on the grade.

Under-body scarifier of the TRAV-L-PLANT makes secondary scarification an easy task in the cloddy clay soils of central Illinois. The scarifier is standard equipment on this machine.

*Here is a new complete-line Bulletin describing all of the Seaman-Andwall products. You'll see them at the Road Show — but send NOW for this valuable literature for your files. Mail a postcard today . . . ask for Bulletin CL-57.*

*Stabilizing the World*

**SEAMAN-ANDWALL CORPORATION**

*A Division of American-Marietta Company*

Dept. R-213

MILWAUKEE 1, WISCONSIN

## Two new base form ties eliminate need for nails

■ Two new base ties that are reported to eliminate the need for nails and save on labor in low wall-grade beam forming have been announced by the Symons Clamp & Mfg. Co. One tie is designed for use with Symons wood forms and the other for use with Symons magnesium and steel-frame forms.

Ties plus wedges are all that is required to secure the forms at the top and bottom. Under the old method, nailed cleats were used at the top and band iron at the bottom. The ties, by eliminating the use of nails, increase the life of the forms, the manufacturer states.

Ties are available in multiples of ½ inch, from 4 through 30 inches. The recommended work-load for the magnesium and steel-ply tie is 1,500 pounds; the recommended work load for the wood-ply tie is 2,000 pounds.

For further information write to the Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 229.

*Visit the Symons Clamp & Mfg. Co. at the Condex Show in the Conrad Hilton Hotel, Booth 82.*

## Lincoln announces awards

The James F. Lincoln Arc Welding Foundation, of Cleveland, Ohio, has announced its $25,000 machine-design award program, which consists of 26 awards for papers giving the best descriptions of the design and fabrication of machines or machine components designed for arc welded steel fabrication. The program is divided into three sections, each for a different type of machinery, and each comprising a separate competition; the three divisions include industrial machinery; construction and mining machinery; and jigs, fixtures, and tooling.

Requests for information concerning rules and conditions of the contest should be addressed to Secretary, The James F. Lincoln Arc Welding Foundation, P. O. Box 3035, Cleveland 17, Ohio.

←For more facts, circle No. 600

Subbase aggregates blade mixed and watered, compaction is achieved by Tampo rollers. Two Tampos work in tandem behind the Oliver tractor, while a single Tampo works behind another tractor, background.

# Work on culverts and canals makes grading, base jobs easier

Working schedules, always important in highway paving, were doubly important on a $400,000 New Mexico State Highway Commission contract held by Brown Contracting Co., Albuquerque, N. Mex.

This job, involving construction of a new two-lane highway for U. S. 550 on a new location just west of Farmington, is located in the famous "four corners" area of New Mexico, where it borders on Arizona, Utah, and Colodaro. This area is alive with oil and gas development, pipeline constructions, and uranium mining, and a new road, replacing an obsolete highway, was needed to keep up with traffic created by these booming industries.

The work called for irrigation canals and ditches to be completed fast, for this is also a heavily irrigated farming country and farmers had to have irrigation water for their land during the growing season. Another pressing requirement was the construction of eight reinforced-concrete culverts that had to be finished early so they would not interfere with grading.

This project involved 274,000 cubic


*Improving wire rope service with* LESCHEN HKP *Red-Strand*

## How to prove wire rope performance for yourself

There is a difference in wire rope—in types, in constructions, in brands. And using the right rope every time can easily reduce rope costs by 10% to 20% or more.

How do you know which rope is right? First, get good advice. Leschen field men, distributors and Leschen's engineering department can help you make the best choice. Second, prove it out with easy-to-use Leschen Service-Score stickers. They tell you right on the job how you're doing—help you make accurate comparisons.

Keep the score—see the results—and you'll use more Red-Strand Wire Rope. See your Leschen man or write Leschen Wire Rope Division, H. K. Porter Company, Inc., St. Louis 12, Missouri.

Leschen engineering advice and Service-Score Stickers are yours for the asking. Write for fact-folder.

HKP LESCHEN WIRE ROPE DIVISION
H. K. PORTER COMPANY, INC.

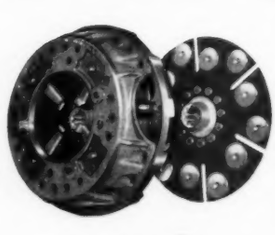
For more facts, use Reader-Reply Card opposite page 18 and circle No. 601

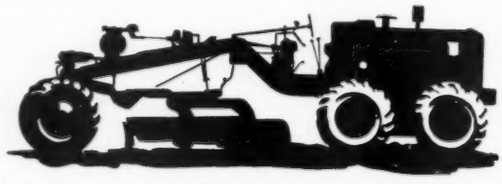


ROCKFORD

MORE

CLUTCH LIFE
TORQUE CAPACITY
HEAT RESISTANCE





"MORLIFE clutch has gone 851 hours without slipping or adjustment."

"MORLIFE clutch going strong after 1695 hours, working in sand."

"MORLIFE clutches last 950 hours longer, without adjustment."

"MORLIFE clutch needs adjustment once a month, instead of daily."

"MORLIFE requires lighter handle pull and one tenth the adjustments."

"MORLIFE pulls harder and lasts six to ten times longer."

"Won't buy a unit that isn't equipped with Durable MORLIFE clutch."

Designed especially for use in heavy-duty, high-speed engine equipped machines such as trucks, tractors, earth movers, graders, shovels, cranes, dozers and oil field units—

*New* MORLIFE® CLUTCHES and CLUTCH PLATES Give-

MORE Clutch Life (400% MORE)
MORE Torque Capacity (100% MORE)
MORE Heat Resistance (50% MORE)

See this NEW type MORLIFE clutch at the Road Show in Chicago—or get full information how this clutch improves the operation of heavy-duty, off-highway machines, by writing Department E—

See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 3, 1957

ROCKFORD Clutch Division BORG-WARNER
314 Catherine Street, Rockford, Illinois, U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 602

***Irrigation canals are dug by part of earthmoving spread; three combinations of grading rigs used on various hauls***

A truck loads subbase material from the surge bin at the rock plant setup. A Pioneer primary unit has a 20×36 jaw crusher, the Cedarapids Master Tandem uses a 10×36 jaw.

yards of unclassified excavation, a flexible base requiring 64,000 tons of material, and a double shot asphalt penetration surface treatment. This latter is part of the stage construction of this highway; plant-mix asphalt surfacing is scheduled for a later contract. Miscellaneous items like the installation of fencing and corrugated metal pipe drains were also part of the work.

**Culverts built first**

Since much of the work could not be done until the concrete culverts had been built, these structures were started almost as soon as the Brown spread moved onto the site and completed in about six weeks. The regular short-haul scrapers of the grading fleet did most of the excavation for the structures, and this was finished off by a truck-crane with a dragline bucket. The biggest excavation was for a 4-barrel, 10 × 12-foot box 100 feet long.

The necessary forms for the structures were prefabricated in Brown's carpenter yard, which was located near the company field office and camp near the midpoint of the project. Ship-lap lumber was used for footings that were not exposed, while exposed concrete was formed against oiled plywood, nailed to 2 × 4 studs placed on 12-inch centers. Carpenters working with power tools were able to turn out the forms at a good rate, since the flared training walls were built on straight lines and walls and floors were standardized as much as possible.

The concrete placing setup was small, capable of handling 30 cubic yards per hour. The biggest single pour it handled amounted to 240 cubic yards.

The batching plant consisted of a CMC dual-bin manual unit, with two bins that were charged from ground-level piles of sand and aggregate by a Wagnermobile scoop. Concrete aggregates were manufactured at the site by a flexible-high-capacity rock plant that also screened and crushed rock for the granular base. Sand was supplied to the job by San Juan Gravel Co., Farmington, and Ideal Type II sack cement, used at a ratio of six sacks per cubic yard, was transported to the job from Colorado.

(*Continued on next page*)

Electric steer, and big low-pressure tires, let the "D" self-load quickly and safely in narrow lanes between grade or form stakes. Between small-yardage assignments such as this, "D" can deliver profitable yardage working with your big-production fleets.

***for big jobs . . .***

***little jobs . . .***

***scattered jobs . . .***

***clean-up jobs . . .***

***finishing jobs . . .***

When Winkelman-Tompkins-Jones, of Plattsburg, New York (working on a joint venture contract) built runways for the Plattsburg Air Force Base in New York State, blow-sand left imperfections in the grade between forms. One D Tournapull was sent in to repair the damage before final paving was begun. The "D" quickly removed the blow-sand and leveled the grade where it was uneven. One man, and one machine, did this quickly, sparing work crews for other duties.

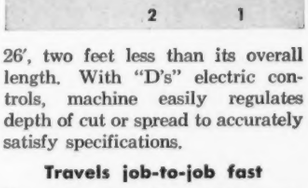
On hundreds of other earthmoving operations, the 7½-yard "handyman" D Tournapull has handled a wide variety of job assignments. It hauls fill, levels sub-grades, slopes shoulders, cuts drainage ditches, fills washouts, levels land for building sites, handles clean-up on construction projects . . . all at low cost with only a one-man crew.

**Works alone, or in fleets**

This rubber-tired hauler fills the need for a fast, flexible self-propelled scraper to handle both large and small yardage assignments . . . on long and short hauls.

With its 7½-cubic yard heaped capacity, D Tournapull is large enough and fast enough for profitable use in pusher fleets . . . yet small enough for economical one-man operation where self-loading is a desirable advantage. It works easily in tight quarters and around obstructions, making 180° turns in 26', two feet less than its overall length. With "D's" electric controls, machine easily regulates depth of cut or spread to accurately satisfy specifications.

Used in pairs, D Tournapulls help push-load one another . . . eliminate need for tractor or grader pushers. For example, scraper #2 first loads scraper #1 . . . then #1 turns, assists #2




**Travels job-to-job fast**

Not only is the "D" highly versatile, it *runs* from one worksite to the next . . . over highways or cross-country, over curbs and railroad tracks, at speeds to 29.5 mph.

You don't need a truck-and-trailer to haul D Tournapull to its assignments. You eliminate all loading and unloading delays. And on production earthmoving, the "D" works fast . . . moves more earth in less time than big crawler-tractor-scraper combinations costing thousands of dollars more.

Ask for owner-verified reports of actual performance records. Tournapull's advantages can help you. Contact your LeTourneau-Westinghouse Distributor for information. He is always at your service.

Tournapull—Trademark Reg. U.S. Pat. Off. DP-943-G-b

**LeTourneau-WESTINGHOUSE Company**

Peoria, Illinois

*A Subsidiary of Westinghouse Air Brake Company*

For more facts, use Reader-Reply Card opposite page 18 and circle No. 603

Two Jaeger 16-S mixers on a special trailer pulled by a Ford truck mix concrete for one of the culverts built along the road.

(*Continued from preceding page*)

Darex air-entraining agent, added to the mix by a dispenser, was used to increase the workability of the concrete and to compensate for ground salts found at this 5,000-foot elevation.

The 4-batch trucks hauled the dry-batched material to a special mixing setup that was used at each culvert location. This consisted of a pair of Jaeger 16-S mixers, mounted on a special trailer frame towed by a Ford F8 truck. This trailer frame also carried a small generating plant to supply vibrating power, and had space for the small tools needed at the culvert site. Batches were charged to alternate mixers so that there was time for workmen to add the sacked cement and for one operator to handle both mixers.

Concrete was either buggied to a pour or handled by a crane with a Gar-Bro 1-yard transfer bucket. During the early stages of the work, mixing water was warmed by butane heaters, and similar heaters were used to keep the green concrete warm in below-freezing temperatures.

Vertical forms were stripped 24 hours after concrete had been placed, but from 7 to 14 days elapsed before the horizontal decks were stripped. This concrete required a 3,000-psi compressive strength before it could be stripped, and stripping was controlled by test cylinders made at the time of a pour. Hunt Process Clear was applied to the concrete by hand either immediately after it had been finished or after forms had been stripped.

### Grading fleet builds ditches

The 38,000-cubic-yard excavation for the irrigation ditches, so important to farmers in the area, was handled by conventional grading equipment. These ditches were built with a bottom width of 12 feet, side slopes of 2 to 1, and a 5-foot-wide berm at the top. If the canal lay in cut sections—and this was usually the case—a 1 to 1 slope was built above the berm.

The job of digging the ditches, finishing them off at the 12-foot bottom, and even finegrading the slopes with a motor grader was simple enough. But the ditches were located in material that was so porous that a lining of 12-inch compacted clay had to be put down.

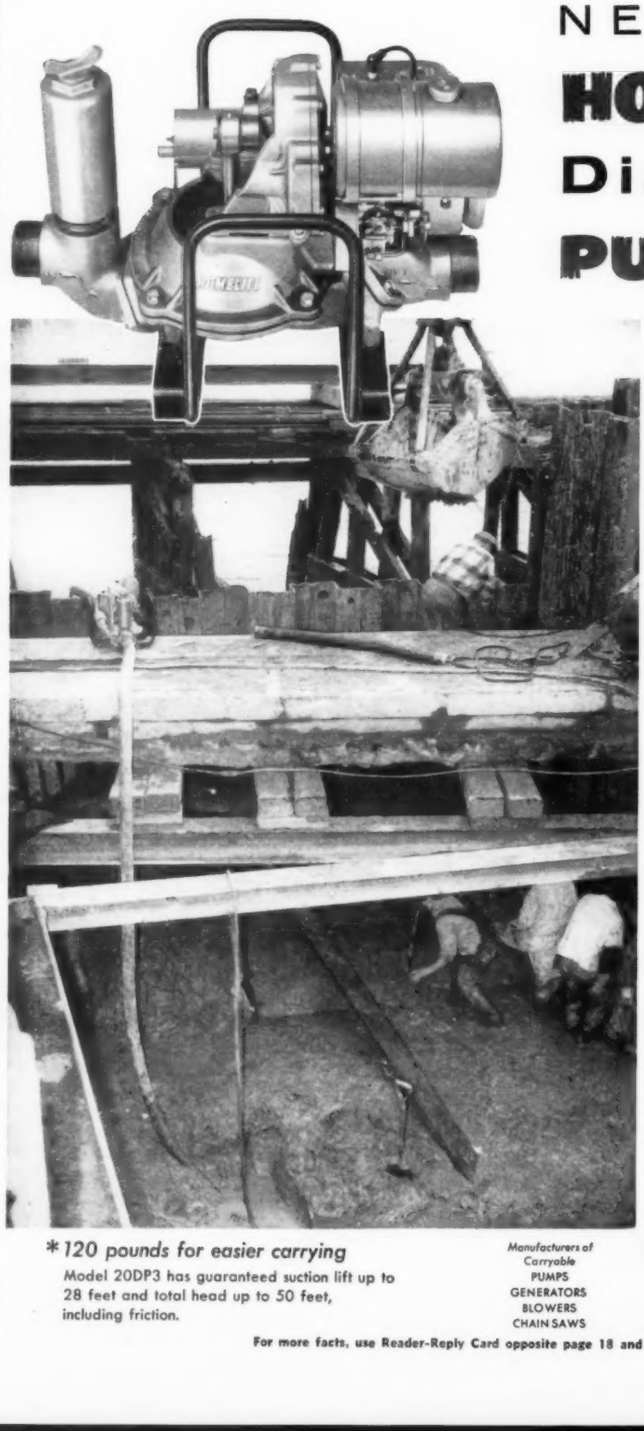
Brown handled this job by having Euclid scrapers bring clay to the ditches and dump it into the bottoms of the canals in the exact amount needed to complete the impervious lining. This brought the clay up to a point approximately 34 inches off the ditch bottom after the dump. The dump was made carefully so that an initial 12-inch bottom lift was placed first and compacted by pneumatic-tire units. The remaining material then followed in the second dumping pass.

The excess material was swept to the top of the canal by a Cat No. 12 motor grader. The operator found it necessary to windrow the material at each toe, then move the windrow up the slope. After being compacted by sheepsfoot and pneumatic rollers, the clay blanket was given a final dressing to make the ditches ready to carry water.

### Grading handled easily

The grading spread, working six days a week, made good time in the unclassified material. This consisted of a sandy loam, sand, gravel, some boulders, and a small amount of bedded sandstone. An extra ripper was made ready to handle the sandstone, and drilling equipment and explosives were ready to be put to use on the material. But a Gar Wood hydraulically controlled rigger, used behind one of the Allis-Chalmers HD-21 pushers, loosened all the rock.

Three main grading combinations

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were used on the stretch. On short-haul work up to 800 feet one way, two Caterpillar No. 80 scrapers with Allis-Chalmers HD-20 tractors were used. An HD-21 was used for push-loading these rigs; a Cat D8 and Ferguson sheepsfoot worked over the fill; and a Caterpillar No. 12 motor grader was used part time to level the material.

Longer hauls were made by three Euclid single-power scrapers. These were push-loaded in the pit by an HD-21. A Cat D8 with sheepsfoot roller was used on the fill. To keep this rubber-tire hauling equipment making good time on the hauls, Brown had a No. 12 motor grader work full time to level the dumped material, keep the haul roads smooth, and sweep loose rock that fell from the scrapers to the side of the road.

The third combination of equipment—a Cat D8 with a LeTourneau-Westinghouse FP Carryall—did finish work on the upper few inches of the fill.

Up to six Ford F800 trucks with 2,000-gallon water tanks worked with the grading spread. This watering equipment had pumps—as per state highway department specifications—to apply moisture to the fill. Jaeger pumps, located at several points along main line feeder canals and in the irrigation ditches which had been excavated by the contractor, were used to load the trucks, which hauled an average of 100,000 gallons of water to the roadway daily.

Compaction of the 8-inch lifts was obtained by sheepsfoot rollers and with 15 hours of special compaction per mile with a Tampo 50-ton pneumatic roller pulled by a Euclid prime mover. This was not test rolling, but final compaction of the upper portion of the subgrade. This roller was helped at times by two smaller Tampos, pulled by an Oliver rubber-tire tractor. This rig was sometimes used in lieu of the sheepsfoot rolling of the finish lift.

Backfilling around finished culvert boxes was handled by three Gunderson-Taylor Triplex tampers and a Chicago Pneumatic tamper. These machines were used only where it was either impossible or dangerous for sheepsfoot rollers to work. Once enough material had been dozed into the excavation to permit sheepsfoot rollers to work, the hand-operated equipment was used to tamp material to about three feet from the concrete.

The 64,000-ton subbase consists of 6 inches of base course material, 2 inches and smaller, and a 3-inch lift of leveling course material, 1 inch and smaller in size. Material for these courses was obtained from the allu-

*(Concluded on next page)*

Brown Contracting Co. uses this special service rig for field maintenance on an Allis-Chalmers tractor. In addition to spare cable, parts, and filters, it carries a floodlight, balanced boom, a Tulsa cable winch, a Chrysler-driven GE welder, Victor oxyacetylene equipment, a Sioux grinder-buffer, Curtis air compressor, a set of Blackhawk jacks, and Snap-on tools.


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(Continued from preceding page)

vial stream bed of the San Juan River, about midway in the project.

The boulder-studded stream-bed gravel and sand were shoved to a feeder trap, and a Pioneer plate feeder moved the material to the upper deck of a 2-deck 4 × 12-foot vibrating screen of the Pioneer 20 × 36 jaw crusher powered by a General Motors diesel engine.

The upper screen deck retained the 4-inch plus rock and dropped it through the Pioneer jaw crusher. The bottom screen deck, with a 2-inch mesh, passed all acceptable portions of the raw feed and retained the 2 to 4 inch fraction. Material passing the bottom deck went, via conveyor, to the surge bin that loaded trucks.

Triplex tampers and a single Chicago Pneumatic tamper backfill around a culvert. Hand tamping was done 3 feet along the concrete; the remaining compaction was done by the sheepsfoot roller pulled by the Cat D8.

All retained material was sent to the second plant unit for reduction.

This unit was a Cedarapids Master Tandem plant, with a 10 × 36 jaw crusher and a set of 4022 rolls, that was powered by a Caterpillar D17000. After rock had been reduced to desired size, it was sent by a stacker conveyor to the surge bin.

About 80 per cent of the raw pit material had to be crushed, and throughout the job, regular hardsurfacing maintenance was done on the roll crusher rods with Resistoloy rod.

While it was producing concrete aggregates, the plant also turned out the ¾ and ⅜-inch chips for the double asphalt-penetration treatment. A ¾-inch buzzer screen separated the coarse particles, which had to be fairly uniform. A ⅜-inch screen dropped the waste material away, and the ¾ to ⅜-inch fraction was rerouted to another ⅜-inch screen which separated the fine chips. About 60 per cent of the ⅜-inch chips were produced this way while coarser chips were also being produced.

Subbase installation was done in the usual manner: Motor graders blended the particles as water was added, then the material was compacted by three Tampo units: two pulled by Oliver and Case tractors; the third—the 50-ton unit—by a Euclid prime mover.

The finished base was primed with MC-1 asphalt, and chips were bedded in the 120 to 150 AC by an Etnyre distributor. A self-propelled chip spreader, sold by Lively Equipment Co., Inc., Albuquerque, was used to apply the chips.

**Personnel**

The contractor's operations were under the general supervision of Leroy Evans, general superintendent. Paul Rosenbaugh was office manager; Voyd Stewart and Tom Lowance, dirt foremen; Red Ward, structure foreman; and Carl Austen, crusher foreman.

L. D. Wilson, chief highway engineer of the New Mexico State Highway Commission, had general supervision for the commission. H. F. Leslie is construction engineer; C. P. O'Bannon at Albuquerque is district engineer, and C. A. Winters was project engineer. THE END

*A new FHA-approved technique permits strip flooring to be laid over concrete without the use of sub-flooring. It features the use of 2×4-inch lumber screeds embedded in mastic.*


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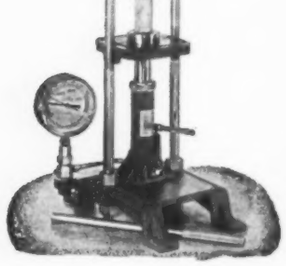

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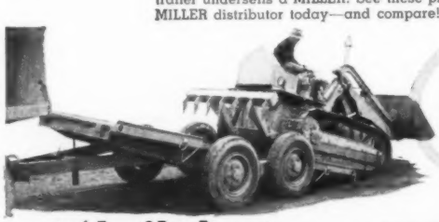

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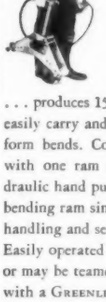

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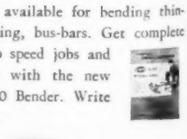

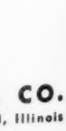

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# States busy on new methods to assist in highway design

by ROBERT E. PYNE, Assistant Chief Engineer, Massachusetts Department of Public Works

***Developments point way toward integrated system of photogrammetry and electronic computation***

Of all the problems facing highway engineers as the new roadbuilding program swings into motion, one of the most serious is the shortage of skilled personnel needed to plan and design the roads.

But in the next few critical years in road building, engineers themselves will have a chance to develop new techniques to be used with new equipment that will undoubtedly save many man-hours of valuable engineering time. Photogrammetry and electronic computation—still not developed to their full potentiality—are being dovetailed to create a valuable highway engineering aid.

Several states, Massachusetts among them, have been making progress in research and work with these tools. In Massachusetts, photogrammetry as it is currently used is vastly different from that first used by the Massachusetts Department of Public Works eight years ago. And it is a far cry from the aerial photography first used by the department in 1930.

From that year until 1940, ten contracts were awarded to furnish the department with contact prints and mosaics for the location and relocation of various highway routes. The average scale of the contact prints was 1 inch to 600 feet, with the usual 60 percent overlap. They were used with a stereoscope to determine the approximate location of the line as a basis for a reconnaissance survey, and they were also used for studies of layouts at traffic interchanges.

As the use of this method expanded, it became evident that full advantage was not being taken of all of the potentialities of aerial photography. In 1946, the department entered into a contract with Harvard University to take aerial photographs along routes where actual planning was in progress. The aerial work consisted primarily of vertical photography at various scales and with cameras of different focal lengths. A total of 525 miles was flown and approximately 5,500 contact prints, together with more than 350 enlargements were used by engineers on various projects. This experience permitted the advantages and disadvantages of a particular type of photograph to be analyzed.

The results of this research project assisted the department in developing its specifications for aerial surveys and mapping for highways.

#### Photogrammetric maps

The department has been using photogrammetry for about eight years, but until about two years ago, it was limited to reconnaissance and the maps were at a scale of 200 feet per inch with 5-foot contours. One or two jobs were done at 100 feet per inch with 2-foot contours. About two years ago, the department investigated the possibility of making photogrammetric maps at our standard scale of 40 feet per inch, with a view

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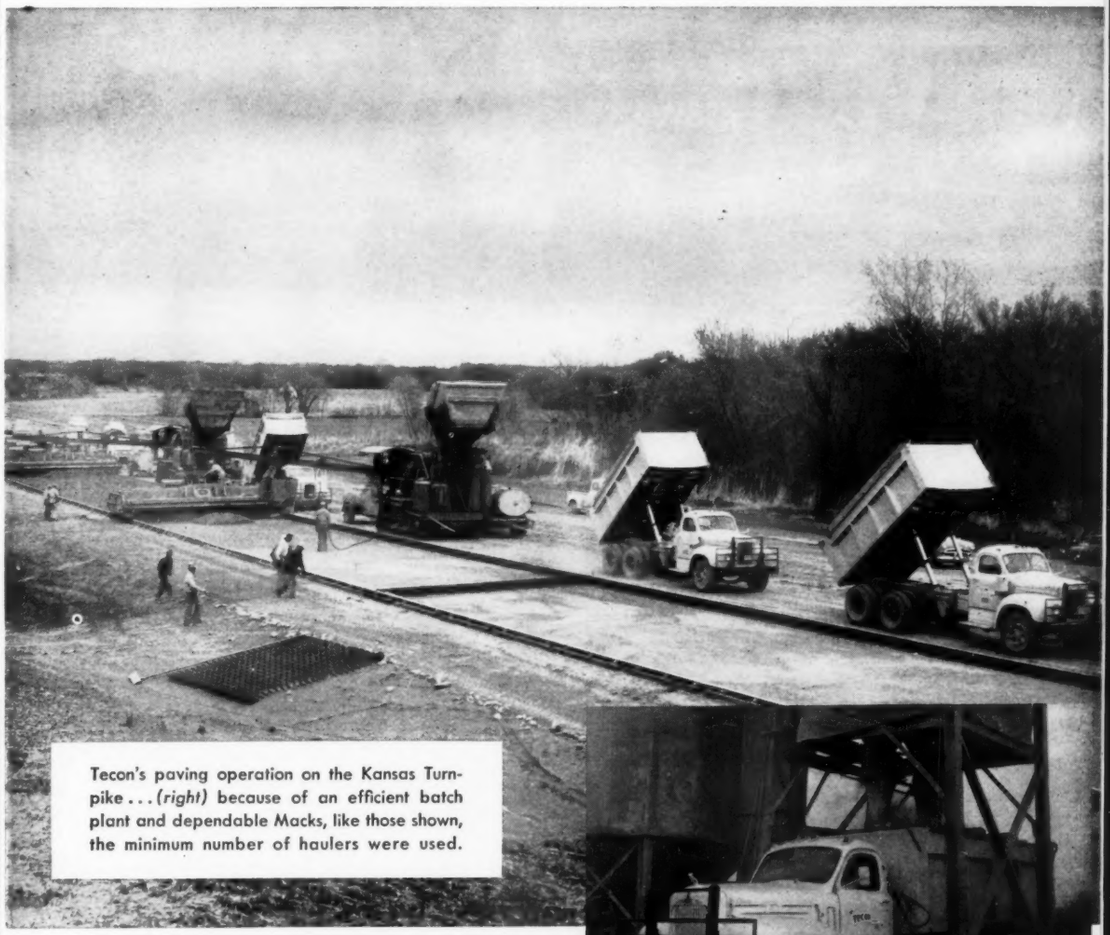

Tecon's paving operation on the Kansas Turnpike . . . *(right)* because of an efficient batch plant and dependable Macks, like those shown, the minimum number of haulers were used.

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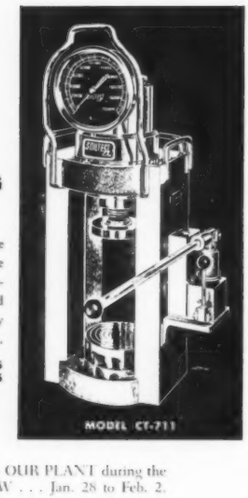


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*(Continued from preceding page)*

to using these maps for working plans in the design section, and later using them to make contract tracings. By scaling cross-sections from these maps, it was also possible to estimate preliminary quantities.

One contract was awarded to map the proposed location of about 22 miles on an interstate route at a scale of 40 feet per inch with 2-foot contours. The location had been previously determined by the use of the 200-scale photogrammetrics. These maps are well within the required accuracy and a check of the quantities—as scaled from the maps against actual cross-sections taken in the field—show them to be within a 2 per cent error over a portion of the job.

On another project, the department awarded a contract for the mapping of about eight miles of relocation at a scale of 40 feet per inch with no contours, but with a profile along a base line to be established by the department, cross-sections every 50 feet, and contract tracings.

#### Procedure set up

As a result of the experience of the past eight years, a procedure has been established for use on major projects. After a tentative line is picked on the United States Geodetic Survey Topographical sheets, it is mapped at a scale of 200 feet per inch, with 5-foot contours. The final location is established and the base line, as computed from the coordinate system on the maps, is run in the field and flagged by the department. This line is flown and planimetric maps made at a scale of 40 feet per inch, a profile and cross-sections plotted by the photogrammetric concern. The department then plots its final design, and contract tracings are made for advertising and construction. Preliminary quantities are computed by the department.

At the present time the department has under contract about 120 miles of 200-scale mapping, one mile wide, with 5-foot contours, at an average price of about $1,200 per linear mile; about 43 miles of 100-scale mapping, ½ mile wide, with 2-foot contours at an average price of about $2,100 per mile and about 56 miles of 40 scale mapping, 1,600 feet wide, with cross-sections, profile and contract plans at an average price of about $2,700 per mile.

The 100 scale maps are used for reconnaissance and study in urban areas, or on the reconstruction of an existing road.

#### Start computer research

For the past six years, the Department of Public Works has been extremely fortunate to have a Joint Highway Research Project with the Massachusetts Institute of Technology. During this period many subjects —such as pavement maintenance, concrete deterioration, traffic, soils, bridge vibration, and geometric design—have been investigated and the results of these studies have been made available through papers presented at the National Highway Research Board Meetings in Washington, D. C. As part of this project, research on the application of electronic digital computers to highway engineering problems was started this spring and is now well under way.

The work with the digital computer started with a general study to find out about the types of computers available, what work had already been done with them for highway computations, and the types of problems on which it had been used.

Since borrow pit computation has


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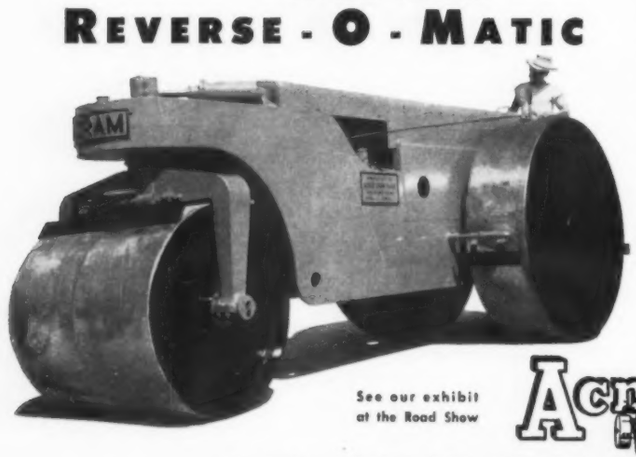

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long been one of the more drab tasks of the highway engineer, it was decided to approach this problem first. A program—or a detailed set of mathematical operating instructions to the computer—was developed to calculate the cubic yardage of borrow pits. It is a far faster method of computing yardage than any of the older ones, as it eliminates much of the time required for transcribing notes and plotting cross-sections. Actual computation time is reduced to a very few minutes. The capacity of the machine used is such that the engineer can compute 400 cross-sections, of better than a mile in width, in one pass through the computer.

All program and borrow pit information is first punched into cards and then fed into the computer, an International Business Machine 650 magnetic drum data processing machine. The deck of program cards for each borrow pit is used only once. First the program is fed into the machine and stored in electronic memory of the rotating drum. Data cards for a borrow pit are next fed into the machine. The calculations are made and the answers are stored on the drum. When the computation is completed, the machine punches the results on output cards. These are placed in a tabulator, so that the information on the cards can be converted to conventional printed numbers on paper. A typical borrow pit takes about four minutes to compute on the machine.

The program is so designed that rod readings, heights of instrument and offset distances are punched into cards directly from the field notebook used by the survey party. No change is necessary in the procedures now used by department survey crews. It is contemplated that an office engineer will spend a few hours with each book, doing such things as marking it with necessary instructions and watching for errors in field data before passing it along for card punching. It is preferable for the engineer in charge of the computations to be familiar with programming and machine operation, for he will then be in a position to make adjustments and changes, if necessary, in order to handle unusual cases. With a few modifications, the program can be used with data taken from aerial photographs or from a contour map. Though it is designed primarily for the computation of borrow pit quantities, the program can also be used to compute volumes of earth excavated at building sites, volumes of excavation for dams, or any other all cut or all fill quantity. The program works particularly well in cases where the contractor receives periodic payments, because new data on any work can be combined with old data to yield a measure of progress since the previous payment.

#### Tailor earthwork program

At present, the Massachusetts Department of Public Works is attempting to develop an earthwork program designed to fit its highway design standards. A pilot project has been selected on a section of Route 128 in Canton, which is a part of the circumferential highway around Boston. This is a six-lane divided highway with a depressed median area. Two computer manufacturers have been given contracts to develop a program to calculate the earthwork quantities. The department will then be able to check the quantities derived from this program and the use of computers against those already calculated by our present method. This will enable the department to evaluate the accuracy, and cost and time saving factors of its own program.

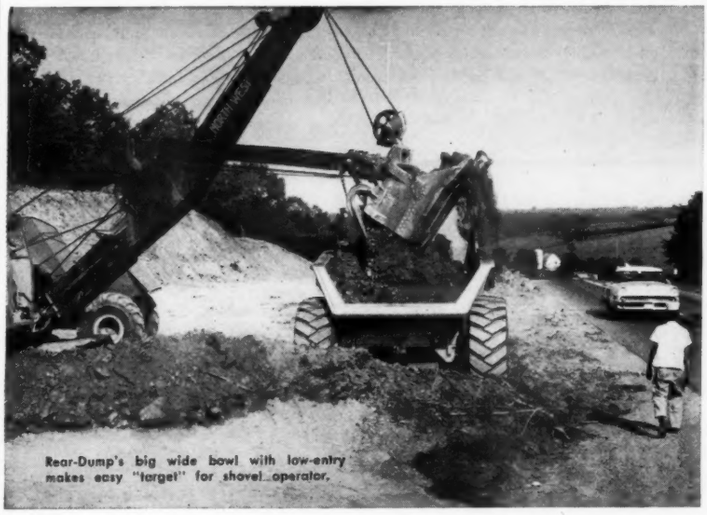
The Department also has a computer on order, primarily for the use of the accounting division. In the meantime, engineering personnel are being trained for its operation, and particular emphasis is being placed on traverse, borrow pit, and earthwork computations.

It is my understanding that the Bureau of Public Roads is to act as the clearing house for information from the various state highway departments on the use of highway calculations of electronic computer systems. If all states keep the bureau informed of their progress duplication will be avoided and the combined efforts of the states will produce results.

#### Increase research

Early this year, a special agreement was also made between the department and M.I.T. that had the effect of increasing the amount of research being done for the Department.

The preface of the agreement states the project to be ". . . a research program on the use . . . of photogrammetry to conserve engineering manpower and reduce time and costs . . . ." This is a broad definition of the

Rear-Dump's big wide bowl with low-entry makes easy "target" for shovel operator.

# Speed 350,000-yd. job

## on U. S. Route 460 with 3 Tournapull Rear-Dumps

To widen U. S. Route 460 in Campbell County, Va., from 2 lanes to a 4-lane divided highway, Talbott-Marks Company, Inc., Clarksville, Va., has 350,000 yds. of shale and rock to haul from cuts to fills. Equipment brought in by contractor to handle job included 3 C Tournapull Rear-Dumps and one 1½-yard shovel.

Production figures on a typical 5000′ cycle showed each C Rear-Dump averaged 10 trips per hour. Loads per machine averaged 10 yds. Each rig hauled 100 yards per hour to total 300 yards for the three. Haul route was in fair condition with 7% return grades. Speed and maneuverability of Le-Tourneau-Westinghouse units kept them well ahead of loading shovel. 90° turn-ability of Rear-Dump lets operator swing hauler quickly into position at shovel for elimination of spotting delays.

Owner A. W. Talbott says units are "Very satisfactory." Two of his Rear-Dumps were driven 354 miles to this job from Hereford, Md., in 18 hours, where they had worked on a 300,000-yd. rock section of the Baltimore-Harrisburg expressway.

If you have a hauling problem, it will pay you to investigate the Le-Tourneau-Westinghouse Rear-Dump. Write or call us for further production studies and specifications. There's no obligation.

Passing on incline, Rear-Dumps speed along haul route on big, single, low-pressure tires.

***There's a size to fit your needs***

| Model | Capacity | HP | Overall Length |
|---|---|---|---|
| D | 11 tons | 138 | 25′2″ |
| C | 22 tons | 208 | 30′ |
| B | 35 tons | 293 | 37′3″ |

| Model | Width req'd, non-stop 180° turn | |
|---|---|---|
| | Travel position | Dump position |
| D | 24′8″ | 19′2″ |
| C | 28′8″ | 20′8″ |
| B | 35′ | 27′ |

***Check these advantages as applied to your job***

**Hauls anywhere** — Big single low-pressure tires let Rear-Dumps safely travel narrow haul roads, paved highways, city streets . . . haul cross-country over roughest terrain, through muck and soft fills.

**Turns in less space** — This Rear-Dump makes 180° non-stop U-turn by power steer in less than its own length. It eliminates time normally wasted see-sawing to back into or turn in narrow quarters.

**Reduces maintenance** — Because these Rear-Dumps have no jack lines, no long drive-shaft, no frame, subframe, springs or tie rods, most common troubles of conventional rear-dump haulers are eliminated.

**Dumps fast, clean** — Flick of switch activates hoist motor. Body lifts quickly to any desired angle for spreading on run. At full dump position, bowl-lip is behind rear wheels so dump can be made clean over bank. Streamlined body sheds material readily.

**Cuts weather delays** — Power-transfer differential automatically applies power to drive wheel on firmest footing . . . pulls unit through mud, sand, soft materials which stop ordinary haulers. It's a Tournapull exclusive.

**Resists body shock, damage** — Three-layer, all-steel, grid-type bowl with tool-steel floor resists loading shocks. Big, wide bowl opening (8′9″ x 10′10″) is easy target for any loading unit.

**Improves safety** — Multi-disc air brakes have more braking surface on one wheel than most haulers have on all 4. Low center of gravity, good visibility, front-wheel drive, easy control all contribute to maximum safety.

**Delivers full power** — Torque converter (optional in C size) automatically balances load and torque so you get full horsepower always. Lugging is reduced; shocks in transmission and final drive virtually eliminated.

**Reduces fatigue** — Big low-pressure tires, 24.00 x 25, and air-foam cushion seat smooth out ride for operator. Electric push-buttons control power steer and 2-way power dump. Eliminated is loss of momentum and all manual work of fighting balky levers.

**Insures future earnings** — Behind Tournapull prime-mover, you can interchange rear-dump with scraper, bottom-dump, crane, flatbed. These trailing units lower your investment, let you handle any future job efficiently, help you keep your Tournapull profitably busy the year-around.

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agreement, which is designed mainly so that the research staff will be available to assist the department on any subject within the scope of the project.

This agreement is divided into five phases—basic considerations, review of current practices, photogrammetric accuracy factors, photogrammetric cost factors, and long range research.

Within the scope of Phase 1, basic considerations, the research staff is working with selected groups and individuals in the department, making available to them technical information on the theory and application of photogrammetry to highway engineering. This is taking the form of group and individual conferences, held weekly at the department and at M.I.T., so that technical data on the latest developments in photogrammetry can be furnished to key department personnel. This will assist them in making optimum use of the method in their work and give them a better understanding of the basic considerations involved.

Under Phase 2, review of current practices, the research staff is available to the department in an advisory capacity to review current practices of the department and to make recommendations and suggestions on them. Technical problems and questions referred to the research staff are reviewed and studied for the person originating the request. In many cases, this may take the form of an on-the-spot discussion between the department member and the research staff member. In other cases, it may take the form of the preparation of an informal report on the subject involved.

Work is underway on an outline of the theoretical and practical factors governing accuracy in the photogrammetric method as part of Phase 3. Previous research on this subject has been in the area of small-scale mapping, such as practiced by the federal government. Little has been done in the area of large-scale engineering topography and other applications in the highway field.

Also within the scope of this phase are investigations on the accuracy requirements necessary for various highway engineering applications and the errors involved in graphical and statistical representation of terrain by conventional practices. This work is concerned with the terrain accuracy required for various phases and steps involved in the location, planning, and design of highway projects. It is felt appropriate to have some knowledge of the level of errors which can be tolerated as well as the level of errors that can be expected from the photogrammetric method.

Photogrammetric cost factors are covered in Phase 4. This is designed to give the department a clear understanding of the major factors that influence the cost of photogrammetric mapping. Of similar importance are the factors which influence the time required to execute various phases and requirements of the photogrammetric process. A guide to such cost and time factors is being prepared by the research staff for the assistance of the department. With such information, the department will be in a position to plan and execute its photogrammetric process in the most efficient and economical manner.

#### Integrated system

Initial investigations made under Phase 5, long range research, have been concerned with the possible development of an integrated system of photogrammetry and electronic computers for the location and design of highways. Photogrammetry may be considered as a data procurement system. An electronic computer may be considered as a data reduction system. Integration may provide a continuous data-handling system with as few intermediate steps as possible. This would take the form of reading, printing, or punching out data directly from the photogrammetric stereoplotter in such a manner that it could be submitted directly to the electronic computer.

The Ohio Department of Highways has made considerable progress in this direction. Investigations of the

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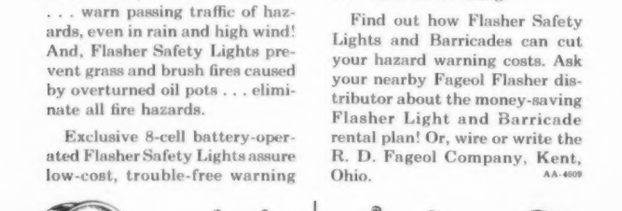


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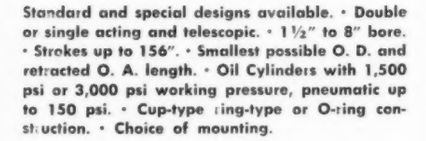

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Massachusetts department are similar with regard to ultimate goal, but it is studying possible different techniques and instrumentation component development. In addition, it is investigating the feasibility of a system that would be completely flexible with regard to horizontal alignment, permitting location changes at will without the need for procurement of a new set of data. Such a system has been developed in preliminary conception form to serve as a basis of attack on the problems involved, but it is too early to report any details at the present time.

Although an integrated system offers great potential in the highway engineering field, there are many problems yet to be investigated and solved. Studies conducted so far indicate the need for a complete re-evaluation of what is basically needed for the planning, design, and construction of a modern highway. If entirely new methods of procuring and reducing data are to be used, is it not possible that there are entirely new and more efficient methods of presenting and using this data at the stage when the human element is involved in planning, design, and construction? Questions like this pose a challenge to future research.

THE END

*From a paper, "Report on Photogrammetry and the Electronic Computer", presented by Robert E. Pyne at the annual meeting of the American Association of State Highway Officials in Atlantic City, N. J.*

## ASCE research award

The American Society of Civil Engineers has awarded one of its 1956 research prizes to Fred Burggraf, of Washington, D. C. Burggraf, the associate director of the Highway Research Board, was given the award "in recognition of his contributions to knowledge through the administration of research in highway engineering and construction materials."

## Powered wheelbarrow has capacity of 1,000 pounds

■ A powered wheelbarrow, available with a 25-inch-long flat bed or a concrete hopper with a 5-cubic-foot capacity, is announced by the Merry Mfg. Co. A 12-inch bed extension, as well as smaller concrete hoppers, is also available.

The Merry Mover features an all-steel welded frame, fingertip clutch control, adjustable fingertip brake control, a recoil starter, 4.50×14 pneumatic tires with traction-grip tread, a differential-action ratchet axle, a remote-control gas throttle, and a one-hand dumping action.

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The Merry Mover takes a concrete hopper with a 5-cubic-foot capacity or a flat bed with a length of 37 inches, including extension, and can handle up to 1,000 pounds.

For further information write to the Merry Mfg. Co., Box 693, Edmonds, Wash., or use the Request Card that is bound in at page 18. Circle No. 253.

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Give to your Unit of the American Cancer Society, or mail your gift to CANCER, c/o your town's Postmaster.

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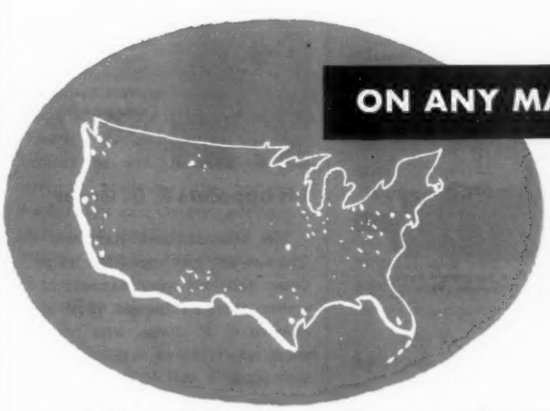

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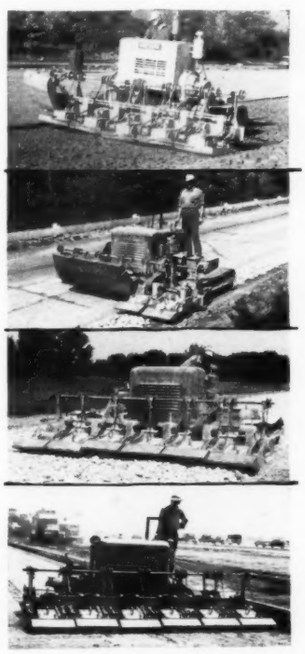

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## Manufacturer memos

### Hercules Motors elects executive vice president

Walter L. Brough has been elected executive vice president of the Hercules Motors Corp., Canton, Ohio, manufacturer of gasoline and diesel engines. Brough, formerly assistant to the president of Hercules, was previously with the Timken Roller Bearing Co. and the Central Alloy Division of Republic Steel Corp.

From 1943 to 1946 and from 1951 to 1953 Brough served with the U. S. Navy as an ordnance engineering officer. A registered professional industrial engineer, he is a member of the American Society of Mechanical Engineers.

Walter L. Brough, the newly elected executive vice president of the Hercules Motors Corp.

### Haight succeeds Jolly as Alcoa vice president

James P. Haight has been appointed vice president in charge of engineering and purchasing for the Aluminum Co. of America, Pittsburgh, Pa., succeeding Thomas D. Jolly, who has retired.

Mr. Haight, who has been with Alcoa since 1920, was elected vice president last April, having served as chief engineer since 1954. Among the various positions which Haight has held at Alcoa are construction supervisor of the government-owned Trentwood works at Spokane, Wash., and works manager of the same plant.

Mr. Jolly, who joined Alcoa in 1915, acted as vice president in charge of engineering and purchasing since 1942. In 1948 he was appointed by former President Hoover to the Commission on Government Reorganization, and later he was named to a Commission task force. Jolly is a past president of the American Standards Association and the National Association of Purchasing Agents.

### Black & Decker creates new positions

Rovan A. Wernsdorfer has been appointed northeastern regional service manager of The Black & Decker Manufacturing Co., Towson, Md. Robert A. Brown is the new central regional service manager, and Elmer G. Shue, the southeastern regional service manager. These are all newly created posts, a result of recent company reorganization.

Wernsdorfer, Brown, and Shue all entered Black & Decker as service repairmen. Wernsdorfer's present responsibilities will include supervising northeastern Black & Decker facilities over the U. S. and Canada for portable electric tool repair service. Brown will cover the central region service


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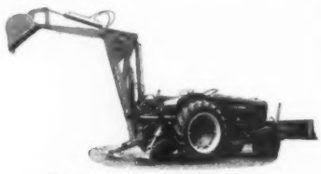

Pippin Construction Equipment Corp. White River Junction, Vt.

Euclid Road Machinery Co., Cleveland, Ohio

Unit Crane & Shovel Corp., Milwaukee, Wis.

Hugh B. Williams, Dallas, Texas

Dart Truck Co., Kansas City, Mo.

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MARVEL SYNCLINAL FILTERS are designed for efficient filtration of hydraulic oils and to provide dependable protection to the inner mechanisms in all hydraulic and other low pressure circulating systems. They meet J.I.C. Standards.

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Sturdily constructed to give long and trouble-free service — yet are easily disassembled, thoroughly cleaned and reassembled in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

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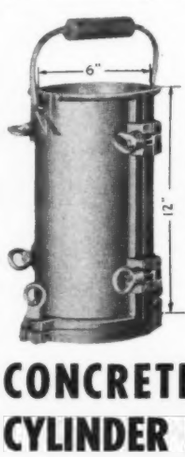
Ralph G. Greer, assistant sales manager of International Harvester's construction equipment division.

### I-H appoints R. G. Greer

The International Harvester Co., Chicago, Ill., has appointed Ralph G. Greer assistant sales manager of the construction equipment division, to succeed C. E. Jones, who has been made supervisor of national contractors' sales.

Greer, who joined International Harvester in 1933, has been manager of the company's Washington, D. C., office for the past two years. He is succeeded in the Washington office by Thomas E. Aughinbaugh, former central regional manager, motor truck sales, who will also supervise the Detroit military products office.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*Road contractors* are gaining new income and cutting costs by using Little Giant Sweepers for cleaning old paving before resurfacing, leveling pea gravel, reclaiming aggregate from shoulders and for general job clean-up work.

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*Airports* clear snow and keep runways clean; industrial plants clean parking areas, storage yards; parks sweep snow and dirt from play areas, roads and parking lots; mines clean coal seams, maintain haul roads.

Whatever business you are in, you can increase your income or cut costs with a work-proved Little Giant Sweeper. There are five models — self-propelled, front-mounted for any prime mover or tow-type — to fit your exact need. See your Little Giant distributor or write direct to start your savings from Little Giant Sweepers.

**Little Giant**
**PRODUCTS, INC.**
1530-1550 N. Adams Street
Peoria, Illinois
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facilities, and Shue will supervise portable electric tool repair service in the southeast.

### Hough Co. appoints new sales managers

The Frank G. Hough Co., Libertyville, Ill., has appointed Robert L. Knox and Herman R. Brown as assistant sales managers.

Knox, formerly a district sales representative, will handle distributor sales and contacts with field personnel. Brown, formerly manager of the order and distribution section of the sales department, will direct manufacturers sales—including those for export, government, and supplemental equipment—as well as scheduling operations.

W. W. Blauvelt, newly elected vice president and general manager of Byers Machine, Inc.

### W. W. Blauvelt elected vice president of Byers

W. W. Blauvelt has been elected vice president and general manager of the Byers Machine, Inc., Ravenna, Ohio, a wholly owned subsidiary of the Thew Shovel Co., Lorain, Ohio.

Mr. Blauvelt, a graduate mechanical engineer of Brooklyn Polytechnic Institute, served 14 years with the Mergenthaler Linotype Co., Brooklyn, N. Y., before coming to Byers in 1953.

### LeT-Westinghouse names Kind as representative

W. T. "Bill" Kind has been appointed district representative in the Pacific Northwest for the LeTourneau-Westinghouse Co., Peoria, Ill. Kind formerly served as a logging specialist with the company's field engineering department. In his new position he will have charge of a territory including the states of Washington and Oregon, portions of Idaho and California, and all of British Columbia and Alaska.

### Bay City appoints

George Frank has been appointed sales manager of Bay City Shovels, Inc., Bay City, Mich. Frank, who has been with the company for 18 years, previously served as a sales representative, and prior to that he acted as an erection engineer.

Frank A. Phillips will continue as Bay City Shovels' vice president in charge of sales.

### Sherman Products names

Robert W. Humes has been appointed sales manager of Sherman Products, Inc., Royal Oak, Mich. Humes joined Sherman, which manufactures and markets excavating equipment for attachment to Ford and Fordson Major diesel tractors, as a district representative in 1947. For the past two years he has been assistant sales manager.

Warren E. Henderson is now assistant sales manager. Henderson previously served as zone manager covering southern Michigan, Ohio, western Pennsylvania, and West Virginia. In his new position he will direct Sherman's advertising and sales promotion activities.

Sherman produces and markets excavating and material handling equipment for Ford and Fordson Major tractors.

### Smith is appointed by SKF

SKF Industries, Inc., Philadelphia, Pa., has appointed Stuart H. Smith vice president in charge of sales. Smith, who has been associated with SKF for 22 years, previously served the company as general sales manager.

Smith is a member of the Society of Automotive Engineers, the American Management Association, the Anti-Friction Bearing Manufacturers Association, and the National Sales Executives Association.

### Symons names manager

J. Frank Pearson has been appointed manager of the West Coast operations at the San Leandro, Calif., plant of the Symons Clamp & Mfg. Co., Chicago, Ill. In his new post, Pearson will be in charge of all Western sales, production, distribution, and management activities.

John W. McEvoy, newly appointed vice president and general manager of the Lebus Mfg. Co., a subsidiary of the American Hoist & Derrick Co.

### American Hoist & Derrick appoints vice president

John W. McEvoy has been appointed vice president and general manager of the Lebus Mfg. Co., Longview, Texas, a wholly owned subsidiary of the American Hoist & Derrick Co., St. Paul, Minn.

McEvoy, a 17-year veteran of American Hoist, was formerly located in the South Kearny, N. J., and the St. Paul plants.


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**SAFE** Patented combustion chamber makes Midland Portable Heaters the safest and most efficient on the market. 100% of fuel is burned, therefore they operate free from all noxious odors and gases.

**QUICK** Just plug the cord into the nearest electric outlet, flip the switch and instantly you have plenty of circulated, forced warm air.

**HEAT** Midland offers three models to choose from, delivering from 120,000 BTU's to 300,000 BTU's per hour. Operate economically on kerosene or fuel oil for only pennies per hour.

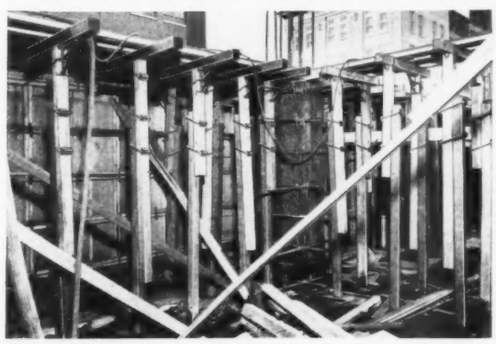
**For more detailed information and prices see your dealer or write direct**

**MIDLAND PRODUCTS CO.**
MIDLAND PARK, NEW JERSEY, U.S.A.

For more facts, circle No. 623



## 17-Story All-Reinforced-Concrete Building ... ELLIS PRODUCTS USED THROUGHOUT!

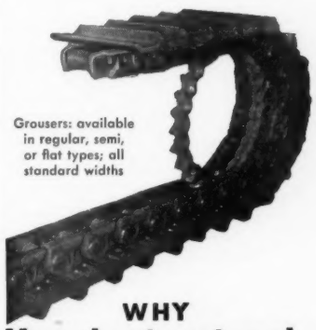


**TWO METHODS OF SHORING,** with two types of Ellis Heads, are shown above. At left in photo, for beams up to 30 inches wide, the standard Ellis Head with Head Clamp can be installed in a few seconds on any shore. At right is the Ellis Double Head with two shores, for wide beams . . . quickly erected by *one man*, since the shore held by the head clamp positions the double head until the second shore is slipped into the slip-in shore holder. On a single head, using Ellis Methods, it is possible to *eliminate* driving about 25 nails, making 6 saw cuts, and ruining 6 or 7 lineal feet of 1x4 or 1x6—as compared to the ordinary "nail on" head. Get hundreds of uses instead of 10 or 15—use Ellis Methods for big savings of material and labor!

**ELLIS Mfg. Co., Inc.** 211 NORTHWEST 4TH ST. OKLAHOMA CITY, OKLA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 624






## WHY Kensington track LASTS SO LONG

There are two reasons why these tracks give you longer service, even under severest working conditions: (1) KENSINGTON's new, improved design, and (2) superior, wear-resisting alloyed manganese steel.

**New Design.** Rigidity and near-perfect alignment are made possible by one-piece rail design and special heat-treated alloy pins pressed tightly in place under high pressure. Anti-shear lugs on grouser plate fit snugly over tie bar of link to eliminate loose plates, elongated bolt holes, twisting, weaving, and side-sway . . . the most common causes of bolt loosening and track trouble. Grousers are heavied-up at all critical points to better resist bending and breaking.

*Yet, despite all these improvements,* KENSINGTON *Track Assemblies fit all standard, popular make crawler tractors.*

**Steel with Stamina.** Special, hard, tough, KENSINGTON-developed alloyed manganese steels actually fight back against wear! They constantly develop extra surface hardness when exposed to friction, abrasion, and impact.

KENSINGTON tracks come from the factory ready-assembled, easy to install.

**Discover** for yourself how much KENSINGTON tracks will lower your maintenance costs and improve your operating efficiency. Coupon will bring details.

**Kensington STEEL COMPANY**
SUBSIDIARY OF POOR & CO., CHICAGO

**KENSINGTON STEEL CO.**
**Dept. A, 505 Kensington Ave., Chicago 28, Ill.**

● Please send information on crawler tracks for tractor described below. I understand I will be under no obligation.

Make of tractor_____
Model_____ No. links per belt_____
Width of grouser_____
NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE_____
STATE_____

For more facts, use coupon or circle No. 625

## labor review

**Ironworkers in the state of Washington** and the Seattle and Mountain Pacific Associated General Contractors chapters are 14 cents apart on hourly rates as their current contract expires. The Washington State Iron Workers, representing some 2,000 men, has been demanding an increase of 28 cents; the contractors have offered 14 cents, which is the increase given to other crafts in the area under long-term agreements.

Unofficially, the union has said "no contract, no work", and the possibility of a statewide strike hovers over the negotiations. The hourly rate for structural workers has been $3.07. In addition, employers have been contributing 10 cents an hour to a health-welfare fund. The old contract, which covered all Washington ironworkers except those in the five southwestern counties of the state, expired December 31, 1956.

**Florida employers and unions will** now find a National Labor Relations Board closer to home. The NLRB has announced the formation of a twelfth region to include all of Florida except the 12 northwestern counties. The new office will be located in Tampa and will handle cases which formerly went to the Tenth Regional Office in Atlanta. The New Orleans office will handle the labor problems of the 12 counties not included in the new region.

**The Missouri chapter of the Associated** General Contractors, on the fifth anniversary of its safety program, is pointing at the results with understandable pride. A decreasing combined accident rate has marked the program since its inception in 1952.

The combined rate for the first year was 232. The figure dropped to 214 in 1953, dipped to 186 in 1954, and fell again to 140 in 1955. Although final figures for 1956 are not yet available, indications are that there will have been another substantial decrease.

The AGC believes the heightened reporting by smaller members of the Missouri chapter is one of the reasons for the steady decline in the accident rate. In 1955, the 30 accident-free firms worked an average of less than 28,000 man-hours each. The overall average for members of the chapter was 125,000 man-hours. In 1956, all but one of the chapter's 105 members filed annual accident reports.

**Meanwhile, the drive of Michigan** building tradesmen for a safety code appears to be gathering momentum, as the Building Trades Legislative Conference, to be held in Lansing next month, draws near. A group of building tradesmen made a recent pre-conference visit to Governor Mennen Williams to enlist his support for the program. The union officials asked Gov. Williams to include a request for the safety code in his message to the legislature on January 9.

The Lansing conference is expected to act as a giant lobby to push the safety code through. Interest in the code, which has been in the works for five years, reached a high pitch in October after an accident which resulted in the deaths of ten building tradesmen.

The building tradesmen also have some other legislative requests. High on the list is a state "Davis-Bacon" law to make prevailing wage determinations on state construction projects. Another target is a state law to make fringe benefits in union contracts collectible. Statutory committees on atomic energy, the St. Lawence Seaway, and automation is a third aim.

**In New York, the construction** industry will be the next high-hazard group in which the State Labor Department will initiate a cooperative labor-management safety campaign, Industrial Commissioner Isador Lubin announced recently. The campaign will be the second in a series planned by the Labor Department as part of its efforts to shrink New York's $750 million-a-year worker accident toll by supplementing inspection with safety consultation services.


*Cold facts about buying fuels, motor oils and greases*

# Why Standard Oil can serve you

*Got a construction job in the Midwest or Rocky Mountain states? Bidding on one? Already working a job? Then read how you can get better service and better fuels, lubricating oils and greases.*

*How you get service on the job.*

In the 15 Midwest and Rocky Mountain states there are more than 3,900 Standard Oil bulk plants. With this many plants, none can be more than a few miles from your job no matter where it is. Experienced men work out of these bulk plants to see that you get on-the-spot service. They see that you are supplied day and night. If you work two shifts or even three they may too.

In addition, there are 23 Standard Oil division offices in the 15 states. In each office there is a chief automotive engineer and a staff of automotive lubrication specialists. All of these men are qualified to give technical service. Most of the men have engineering degrees. They have received extensive training in Standard Oil's own Automotive Sales Engineering School. *All of these men are* Standard Oil *employees.*

*The kind of service you get from STANDARD*

Automotive lubrication specialists from Standard division offices will survey your equipment and

"We have selected the construction industry for special attention," Commissioner Lubin explained, "because nationally it has the highest injury frequency rate for all major industry divisions, even equalling or exceeding mining, and because the facts indicate that a comparable situation exists in New York State.

"More than 75,000 workmen's compensation awards, paid in lieu of lost wages, were made to construction workers in this state in the five years ending with 1954. The ratio of such payments to the number of construction workers employed was more than three times as great as for the state's entire workforce."

**Concurrent with his announcement** regarding the safety campaign, Commissioner Lubin announced the organization of a construction safety advisory group to aid the Labor Department in bringing to the construction industry its new consultative approach to worker safety. Peter W. Eller, chairman of the Board of Governors of the Building Trades Employers' Association in New York City, was named as chairman of the group.

The advisory committee will draw its membership from builders, heavy construction contractors, and representatives of the labor and insurance interests. The first meeting was held on December 11. The group of approximately 50 heard Commissioner Lubin expand on his evaluation of the situation in the construction industry. No date has been set for a second meeting of the advisory committee as yet.

**Differences over supervision at** the Sparrow Hawk point job site on the St. Lawrence Seaway Project precipitated a four-day work stoppage recently when more than 300 members of Operating Engineers' Local 545 walked off the job. The union members struck in protest against the firing of a shovel operator by the contractor, Merritt, Chapman & Scott.

The company claimed the man was discharged for incompetence. The union disagreed and argued further that the firing was just one more step in a long series of improper disciplinary actions by the contractor. A spokesman for the Syracuse (N. Y.) Associated General Contractors reported that Local 545's grievance was settled after meetings between the job superintendent and representatives of the union.

**Speaking at the International Labor** Press Association convention in Washington, D. C., AFL-CIO president George Meany predicted that mergers between AFL and CIO state organizations would be completed before the December 5, 1957, deadline set up by the national group. Meany warned, however, that the AFL-CIO is prepared to step in and finish the job in any state where it should prove necessary. The deadline for the merger was announced by the AFL-CIO in December 1955.

The president of the combined federation explained that the AFL-CIO feels two years is sufficient time for state bodies to adjust their differences and effect mergers. If any state groups cannot come to terms before the deadline, Meany said, the federation can be expected to take the following action:

(1) Recall the separate AFL and CIO state charters, (2) draft a constitution for a merged state organization, (3) call a convention of AFL and CIO affiliates in the state, and (4) issue a new charter to the merged group.

Thus far, 19 states have effected mergers. They are Arkansas, Missouri, Arizona, Colorado, Alabama, Tennessee, Montana, Louisiana, Virginia, Wyoming, Vermont, New Mexico, Minnesota, Utah, Oregon, Iowa, South Dakota, Maine, and Nebraska. A last-minute clash between the AFL and CIO groups in Florida a few weeks ago wrecked what was considered to be a certain merger in that state.

One discouraging note in the picture is the fact that although 19 states have merged state groups, in almost all states where heavy industry predominates, the two groups have not as yet been able to get together.


# you better

recommend the fuels, motor oils, greases to use. They will help you set up a preventive maintenance program and suggest lubrication schedules. They will back this up with service from the Standard Oil bulk station so that your equipment is *never* idle for lack of petroleum products. Through them you have a direct line to Standard Oil headquarters and laboratory for additional help.

*Why STANDARD OIL products are tops for construction equipment.*

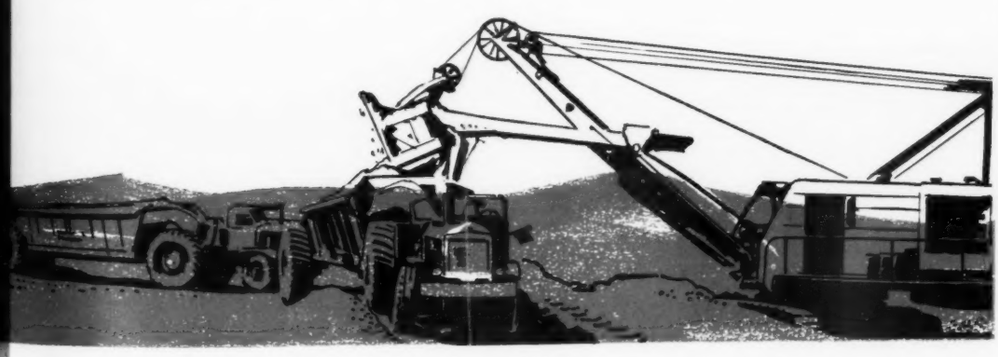
Standard Oil lubricants, fuels and greases are approved by equipment manufacturers. But there's more to it than just that. Most big equipment manufacturers' plants are right here in the Standard Oil territory. Standard works closely with these manufacturers, knows what's needed of the fuels, motor oils and greases used in construction equipment. Standard Oil fuels, lubricants and greases are used by many manufacturers in initial fills and lubrication. All products equal or exceed specifications of the manufacturer. They will stand up to any job you give them with plenty to spare.

*Refinery to you, it's all STANDARD.*

All Standard Oil fuels, lubricating oils and greases are made by Standard and delivered to you by Standard Oil employees with Standard's own distribution system. Everywhere you go in the Midwest and Rocky Mountain states there is a *Standard Oil* owned and operated bulk plant within a few miles. You deal with one company. Every Standard Oil supply point is equally and uniformly well run.

*How to get in touch.*

Because Standard Oil lubrication specialists so thoroughly cover their territory, you can depend upon meeting your man at any important contract letting —if you haven't already met him. If you miss him, look in the telephone directory of any town—no matter how small—nearest your job. You'll find the Standard Oil bulk plant listed under the Standard Oil name. If you still miss, sit tight, the Standard Oil man will be around to see you *before* you need him and he will be ready to serve you starting right then. If you would like more information right now, write or call Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.



**Standard Oil serves these Midwest and Rocky Mountain states**

Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, N. Dakota, Oklahoma, S. Dakota, Wisconsin, Wyoming

STANDARD

**STANDARD OIL COMPANY** (Indiana)

For more facts, use Reader-Reply Card opposite page 18 and circle No. 626

The Model 47J Ranger can carry four passengers or 1,000 pounds of cargo and has a range of 175 miles without the optional auxiliary fuel tank.

## Four-place helicopter has range of 175 miles

■ A new four-place single-rotor helicopter with a range of 175 miles is announced by the Bell Aircraft Corp. The Model 47J Ranger is recommended as an efficient, speedy method of transportation to and between construction projects.

The Model 47J can be used for carrying cargo as well as passengers. Optional equipment includes a kit to convert the craft for ambulance operation and a kit to attach an internal cargo hoist. The hoist makes possible the loading of injured personnel or cargo while the craft hovers in the air.

Power is supplied by a 260-hp engine. An optional auxiliary fuel tank is available to increase the effective range. The useful load of the Model 47J is 1,000 pounds.

For further information write to the Bell Aircraft Corp., Texas Division, P. O. Box 482, Ft. Worth, Tex., or use the Request Card at page 18. Circle No. 314.

## Koehring appoints

The new general sales manager for the Buffalo-Springfield Roller Division of the Koehring Co. is E. S. McCormick. The division is located in Springfield, Ohio. McCormick was formerly special railroad sales representative with Koehring.

## Reynolds Co. establishes aluminum design award

The Reynolds Metals Co., Richmond, Va., has established an international award of $25,000 to be presented annually to the architect judged to have made the "most significant contribution to the use of aluminum, structurally or aesthetically, in the building field".

The award, a memorial to the late R. S. Reynolds, founder of the firm, will be known as the R. S. Reynolds Memorial Award.

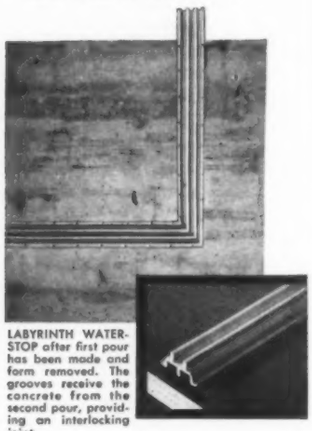
## Heavy-duty trailers

■ A new brochure describing its complete line of heavy-duty trailers for the construction field is available from Transport Trailers, Inc. The new literature describes single, tandem, triple, and trunnion-axle lowbed units; removable gooseneck trailers; single and tandem-axle between-the-wheel and over-the-wheel tiltbed trailers; heavy-duty single and tandem-axle platforms; and special rigs with capacities through 100 tons.

To obtain this brochure write to Transport Trailers, Inc., 1200-34 Twelfth St. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 271.

*Visit Transport Trailers, Inc., at the Road Show in the International Amphitheatre, Booth 344.*


# Waterstop *in place in seconds!*



LABYRINTH WATERSTOP after first pour has been made and form removed. The grooves receive the concrete from the second pour, providing an interlocking joint.

Just a few seconds were needed to nail this LABYRINTH WATERSTOP to the form . . . just a few seconds and water seepage worries were over before they could ever have a chance to start. LABYRINTH WATERSTOP forms a waterproof bond between two pours. The corrugated ribs bond firmly with the concrete.

LABYRINTH WATERSTOPS are made of flexible polyvinyl plastic . . . that has superior weathering qualities, is not affected by temperature changes and chemical activity.

LABYRINTH WATERSTOPS are easy to work with, can be cut to any desired length. "L" and "T" joints can be welded with just a hot knife. Find out now how your costs can be cut . . . and end your seepage problems. Just mail the coupon to:

**WATER SEALS, *inc.***
9 SOUTH CLINTON STREET
CHICAGO 6, ILLINOIS

Made in Canada for
J. E. Goodman Sales Ltd.
Toronto, Ontario

WATER SEALS, INC. DEPT. 3
9 South Clinton Street
Chicago 6, Illinois

*Send full information and sample*

Name_____

Company_____

Address_____

City_____ Zone____ State_____

For more facts, use coupon or circle No. 627



## CUT YOUR COSTS IN A VERY BIG WAY WITH THESE SWANSON MOTOR GRADER ATTACHMENTS

*FOR NO. 12 CATERPILLAR MOTOR GRADER*

Contractors using these testify these tools can and have "paid for themselves in a few days." **RIPPERS — MODELS 10 & 20.** (Pat. Pend.) Both "RIP OUTSIDE OF THE WHEELS and SCRAPER WIDTH." Handle Asphalt, Hard Pan, Shale, Stratified Rock, etc. Highly effective in tight and hard-to-get-at places. **Excellent for cutting close to stakes.** . . . Max. Ripping Depth — 10". REVERSIBLE — can be used on either side. USES Standard 1" x 3" Ripper Shanks. . . . MODEL LO — List Price: **$125.00.** . . . **Model 20** — List Price: **$155.00.** This model can be permanently carried on Moldboard Frame — moveable toward center.

**SWANSON MICRO-GRADER — MODEL 50.** (Pat. Pend.) For use with SWANSON Attachment Support Boot — Models 10 and 20. This "Operator's Micrometer" SECURES EXACTNESS & UNIFORMITY in FINISH BLADE GRADING. Gives you your finish cut in one swipe of the blade. . . . **Helps estimate gouged and chipped curbs.** FEATURES: Adjustable for depth — minus 2" to 9" plus. Can be used on Right or Left Side — and permanently carried out of way on Moldboard Frame. ADJUSTS BOTH LATERALLY & VERTICALLY. **Guaranteed to maintain accuracy.** USERS SAY: "Cuts working time up to 30%." — "Checks exactly uniform all over" — Gets the job done on time." Etc. . . . List Price: **$150.00.**

NEW BULLETINS Giving Complete Information on all above NOW READY. WRITE.

*SALES REPRESENTATIVES WANTED*

**ALL PRICES F.O.B. San Diego**

**SWANSON DRIFT WING — MODEL 70.** (Pat. Pend.) For most Motor Grader makes and models. Reversible — Right or Left side. . . . ADJUSTABLE: Angles IN, OUT and VERTICAL (for accurate spreading of earth, "hot stuff", oil mix, etc.). Fits tilt of blade. Can be attached & removed in approx. 1 minute. Lays flat on back of moldboard when not used. List Price — **$125.00.**

**SWANSON MFG. CO. · 515 63rd St. · San Diego 14, Calif.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 628

BUILD BETTER ROADS TODAY FOR A GREATER AMERICA
See you at the ROAD SHOW CHICAGO Jan. 28-Feb. 2, 1957

Before you buy any truck mixer learn about CMC TED Transcretes first! WRITE FOR NEW, FREE FULLY ILLUSTRATED FOLDER.

***FOR STILL BIGGER SAVINGS— MORE PROFIT ON EVERY POUR***

Use truck engine power without sacrificing performance — save as much as $55 per month per machine on gasoline alone. All the job-tested, time proven BIG VALUE features of other Transcretes — including trouble-free Floating Drive and Swing-Out Hopper. YOUR GUARANTEE OF FASTER CHARGING, MORE THORO MIXING, QUICKER DISCHARGE — AT LESS COST!

CONSTRUCTION MACHINERY CO., WATERLOO, IOWA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 629

## New type pendant thimble permits greater safety

Because the possibility of failure can be detected through visual inspection, the Newco pendant thimble permits a greater safety factor.

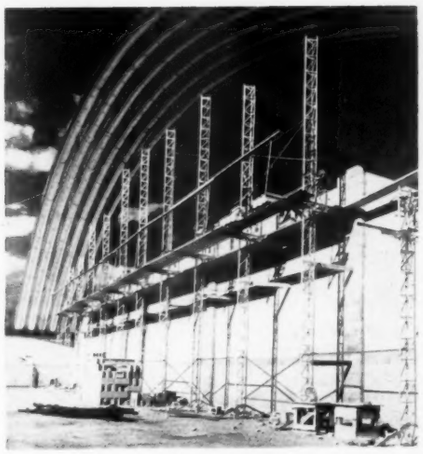
■ A new type of pendant thimble that provides greater safety of boom pendants has been announced by the Newco Mfg. Co. The cast steel fitting enables riggers to apply wire rope by using conventional U-bolt clips or by splicing the rope and swaging it.

In replacing an ordinary zinced socket, the new fitting permits a greater safety factor through visual inspection; the detection of a failure may be made before it actually occurs. The Newco fitting also eliminates failures caused by vibration.

Newco thimbles are available in sizes ranging from 9/16 through 1½ inches. Other sizes may be obtained by special order.

For further information write to the Newco Mfg. Co., 3636 Main St., Kansas City 11, Mo., or use the Request Card at page 18. Circle No. 255.

*Visiting Chicago for the Road Show or AED's Condex exhibit? See pg. 204 for a listing of manufacturers exhibiting at each of these shows.*



The range of heights to which Morgen scaffolding can be erected with the use of the new 9-foot inserts is shown at this construction operation in Colorado.

## Tower extension inserts greatly increase height

■ A new 9-foot tower extension insert for Morgen adjustable masonry scaffolding is said to make possible the erection of the scaffolding to virtually any height.

Morgen scaffolding is a series of towers, each with an adjustable platform carriage suspended by cable from the top. The workman operates the windlass to raise the platform as the wall is built, keeping the mason at a comfortable working level at all times.

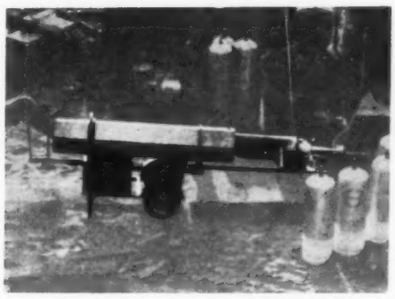
The 9-foot inserts can be used with the C-00-E carriage, which has space for wheelbarrows and cart traffic and material platform supports of two different levels. The carriage, with the proper accessories, allows up to 7⅓ feet of platform space.

For further information write to the Morgen Mfg. Co., 1115 N. Broadway, Yankton, S. D., or use the Request Card at page 18. Circle No. 261.

*Visit the Morgen Mfg. Co. at the Condex Show in the Conrad Hilton Hotel, Booths 31 and 32.*


if you need a **GOOD DRYER**

see the **TARCO** *"Flash-Flame"* **DRYER**



**CONVENIENT:** Dries your sand, stone, gravel, or whatever right when and where you need it . . . *right on the job site.* Screens it, too.

**MOBILE:** Light enough to be moved by two men and carried in a pick-up. Yet more than rugged enough for any job.

**FAST:** You can set up and start a "Flash-Flame" Dryer in less than 15 minutes. Gasoline engine or electric motor drive. Fast acting clutch. Kerosene or L. P. bottle gas fired.

**RELIABLE:** Simple to operate. Easy to service. Requires little storage space. Most inexpensive to own and use.

**TARRANT Manufacturing Company**
**31 Jumel St., Saratoga Springs, N. Y.**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 630

**LOW TEMP LUBRIPLATE**

***Best for Sub-Zero Lubrication***

Highly recommended for general grease applications on all types of machines operating at very low temperatures. Remains plastic at temperatures as low as 70° F below Zero and has a Melting Point of 270° F. Possesses high film strength and is of a consistency that meets all requirements. Can be easily applied through grease guns or by other means of application. Low Temp Lubriplate is waterproof and will protect automotive and other types of equipment against the unfavorable effect of salt or calcium chloride as used on highways during winter months.

**REGARDLESS OF THE SIZE AND TYPE OF YOUR MACHINERY, LUBRIPLATE LUBRICANTS WILL IMPROVE ITS OPERATION AND REDUCE MAINTENANCE**

For nearest Lubriplate distributor see Classified Telephone Directory. Write for free "Lubriplate Data Book". . . a valuable treatise on lubrication. LUBRIPLATE DIVISION, Fiske Brothers Refining Company, Newark 5, N. J. or Toledo 5, Ohio.

For more facts, circle No. 632



# CAROLINA BIG-TIRE SPECIALISTS

## CAN GET YOU ANOTHER FULL ROUND OF SERVICE FROM YOUR WORN EARTHMOVER TIRES

Factory trained tire experts use modern equipment to renew worn tires at our large off-highway-tire plant in Salisbury, N. C. We operate on a 24-hour basis to give customers fast service. WE SHIP TIRES ANYWHERE!

**For half the cost of an expensive new tire you can get a deep, rugged, new tread on your worn tire. And we guarantee the workmanship and material of any tread and repair we make.**

**Factory-trained tire specialists renew your grader, scraper, dozer, tractor, and other earthmover tires. We're equipped to give you GOODYEAR SURE GRIP, HARD ROCK LUG, AND HARD ROCK RIB designs in sizes fom 11.00 x 24 through 33.5 x 33.**

**We're ready to service your tires ON THE JOB SITE anywhere, at any time, through qualified tire-servicing dealers in THIRTY STATES and also with our own fully-equipped service trucks. ASK US ABOUT THE BENEFITS OF OUR PREVENTIVE TIRE MAINTENANCE SERVICE.**

CUTS TIRE COSTS IN HALF

**CAROLINA TIRE COMPANY**
232 N. MAIN ST. SALISBURY, N. C.
**SPECIALISTS IN EARTHMOVER TIRE RECAPPING, RETREADING, AND REPAIR**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 631

A LeTourneau - Westinghouse Tournapull and an Allis-Chalmers tractor work about 50 miles downstream from El Paso, cleaning out material left in the bed of the Rio Grande's main channel by a flash flood.

## Earthmovers handle "dry land" dredging of river channel

The job of cleaning out a river channel—a job usually done by dredge, dragline, pipe and barge—is being handled by a fleet of scrapers and tractors in an 86-mile-long stretch of the Rio Grande.

The rigs are practical for the work, for most of this section of the river is normally dry. Drought in the area and in the watershed upstream has left the river empty, except for the flash floods that occur when isolated storms create streams in the numerous arroyos leading to the channel.

When this happens, the rushing waters leave deposits of silt, sand, and debris in the main channel, and this has to be removed quickly so that the channel will not be blocked during a subsequent storm, creating flood conditions.

As soon as flood waters subside in a section, The Fort Hancock Division of the International Boundary and Water Commission, located in El Paso, Texas, has a trio of scrapers—two self-propelled Tournapulls and a drawn scraper—pulled by a rubber-tire tournatractor-dozer—together with a pair of crawler tractors heading toward the channel for cleanup operations.

## Ralph Budd receives AICE award of merit for 1956

The American Institute of Consulting Engineers presented Ralph Budd with the Award of Merit for 1956 at the organization's annual dinner on November 27 at the Waldorf-Astoria in New York City. Mr. Budd was formerly president of the Great Northern Railway and the Burlington-Rock Island Railroad, and is the retired chairman of the Chicago Transit Authority.

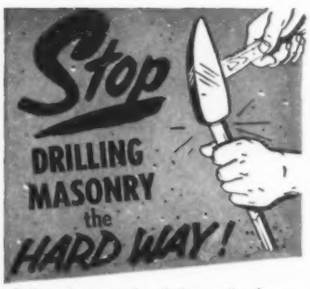
## Concrete form company bought by Waco Mfg. Co.

The Waco Mfg. Co., Minneapolis, Minn., has purchased the assets of the Midwest Concrete Form Co. of Forest Park, Ill. The new company is known as the Waco Concrete Form Mfg. Co.

The concrete forms previously manufactured by Midwest will have improvements in hardware throughout, the Waco one-piece wedge bolt, quick alignment groove, one-piece waler, and self-storing wedge bolts.

Shipments of the new Waco concrete forms can be made from warehouses located at 7737 W. Van Buren St., Forest Park. Robert J. Terry is sales agent for the Chicago area.

*Over one million feet of lumber was used in the roof of the Mormon Tabernacle in Salt Lake City, Utah. This is said to account for the building's remarkable acoustical properties.*


Follow the example of thousands of masonry bit users — large and small — who use the WORLD'S ONLY COMPLETE LINE OF CARBIDE-TIPPED MASONRY BITS — For every drilling requirement — to cut time and labor costs —

Switch to

New England
CARBIDE-TIPPED
MASONRY BITS

**They Make Tough Drilling Jobs Easy! — Speed Work! — Cut Labor Costs! Drill Any Size & Depth of Hole!**

Even experts are amazed when they first learn what New England Carbide-Tipped Masonry Bits can do to make tough drilling jobs simple — and cut labor costs UP to 82%! From fast rotary drilling in soft and medium hard masonry to the toughest jobs in hard concrete or granite — there's a New England Carbide-Tipped MASONRY BIT for every kind of job, and a bit to fit any make or type of drill.

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Cyclo-twist® ROTARY BITS
For ROTARY DRILLING of Medium Masonry — Sizes 7/64" to 1½"

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For ROTARY DRILLING of Hard Masonry including Hard Concrete and Vitreous Tile, Sizes ¼" to 6"

Thunder-twist® HAMMER BITS
For One Man HAMMER DRILLING of all Hard Masonry and Granite — Sizes 3/16" to 1¼"

DISCOVER THE "EASY" WAY FOR EVERY DRILLING JOB! Write for our "WHAT and HOW" MANUAL. It's FREE, and very helpful.

NEW ENGLAND
Carbide Tool Co., Inc.
55 R Commercial St.
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Please send me FREE "WHAT and HOW" MANUAL

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ADDRESS_____

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For more facts, use coupon or circle No. 633



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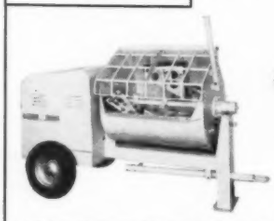
- For the Contractor who looks for quality and high production at lowest cost.
- For the Distributor who wants fast selling lines with minimum service requirements and larger discounts.



Mortar and Plaster Mixers—Available in 4, 6, and 8 cu. ft. models—Oversize drums and power units—Gasoline or electric drive—Power throwouts—Positive protection shaft seals—Rubber wiper blades standard equipment.

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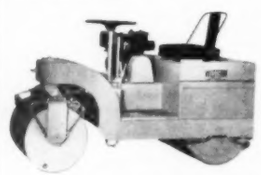
BOOTHS 17 and 18 at CONDEX



Deluxe Power Rollers—1, 1½, and 2 ton models—Standard or portable Tandem design—Self-adjusting scrapers, cocoa mats, and watering system standard equipment—Automotive geared steering—One man operating and transporting.

WESTERN EQUIPMENT DIVISION
Douglas Motors Corp.
MILWAUKEE, WISCONSIN

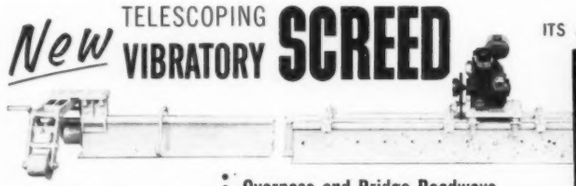
Write: DEPT. CEW 157

For more facts, use Reader-Reply Card opposite page 18 and circle No. 634



New TELESCOPING VIBRATORY SCREED

ITS SHOE-PLATE **NEVER** RIDES THE FORMS



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BUILT ESPECIALLY for
Overpass and Bridge Roadways
Tilt-Up Slabs and Industrial Floors

3,600 to 10,200 Vibrations per Min.

| LENGTH ADJUSTMENT |
| --- |
| • MODEL 302 From 15'-6" to 36'-0" |
| • MODEL 304 From 10'-2" to 25'-0" |
| HEIGHT ADJUSTMENT |
| From ⅓" below to 1¼" above top of forms |

There is a Cmetco Distributor near you. Phone or write for his name and address.

CM-15

The Cmetco Telescoping Vibratory Screed is a radically new piece of cement finishing equipment. It has been engineered to economically solve many of the problems confronting the larger contractors. Costs per cubic yard per man-hour are appreciably reduced. Cost for screeding equipment is less. Better depth compaction is another valuable feature.

Due to its fast telescoping feature it avoids the cost of auxiliary beams. Because it has no beam overhang it can be operated close to existing walls. Forms are protected because the telescoping feature adjusts shoe-plate length to form widths; to fractions of inches if necessary.

- UNSURPASSED FOR DEPTH COMPACTION
- RE-TRANSMITTED VIBRATION AVOIDS DEAD SPOTS
- CONTROLS ITS OWN PILE-UP
- HANDLES MORE CUBIC YARDS PER MAN-HOUR
- QUICKLY ADJUSTABLE LENGTH AND HEIGHT

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*BETTER EQUIPMENT FOR PLACING AND FINISHING CONCRETE*

POWER BUGGIES • TELESCOPING VIBRATORY SCREEDS • ECONOMY VIBRATORY SCREEDS • ROLA PAVERS AND TRENCH BOXES • WOOD AND STEEL TILT-UP HARDWARE • BULL FLOATS • HOPPERS • BUCKETS • ELEPHANT TRUNKS AND CHUTES • TAMPERS • HAND CARTS

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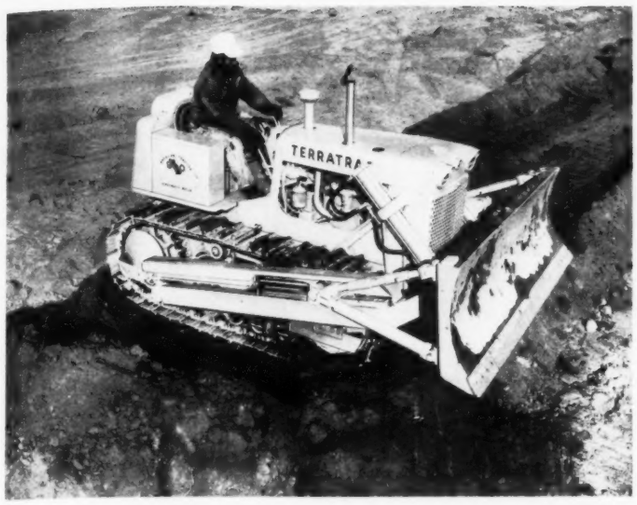


The Case-TerraTrac Model 800 crawler makes use of its counter-rotating transmission to turn around in its own tracks. The dozer blade can be tipped fore and aft and tilted for ditching or road-crowning operations.

# New Case—TerraTrac crawlers feature counter-rotating tracks

The first of the new J. I. Case line of industrial wheel tractors, Terra-Trac crawlers, and earthmoving equipment was unveiled December 10 at Churubusco, Indiana.

Prior to the field demonstration, Marc B. Rojtman expressed confidence that the merger of his company, The American Tractor Corp., and the J. I. Case Co. of Racine, Wis., would result in a 400 per cent increase in production in the coming year. Rojtman, the new executive vice president and general manager of Case, said that this increased production would be effected by integrating Case manufacturing facilities and greatly increasing the number of Case dealers in the country.

At the demonstration, unique technical features in the new Models 800 and 1000 Case-TerraTrac crawlers were revealed. Heading the list of engineering advances in this 80-hp and 100-hp class is the new counter-rotating Terramatic power-shifting transmission, which provides independent power control of each track's speed and direction. With one track moving ahead and the other track moving in reverse, the 80-hp Model 800 tractor can spin completely around within a track radius of 5 feet 7 inches. The operator controls the tracks by either hand or foot controls.

Both the Model 800 and 1000 have four speeds forward up to 6 mph; plus four reverse speeds to 7 mph. Moreover the constant-mesh Terramatic transmission enables the operator to change speeds or direction "on the go" without touching a master clutch or stopping to shift gears.

All machine movements are controlled by four hydraulic clutch levers, a manual speed-range selector, foot accelerator, and two hydraulic foot brakes. These 80-hp and 100-hp tractors are also equipped with a Borg-Warner torque-converter drive. Another feature incorporated in these new models is torsion bar track suspension, which makes it possible for each track to oscillate freely over irregularities in the ground surface while the loader bucket or dozer blade remains perfectly level.

Lubrication of the lower track wheels on these models has been simplified by means of a two-point centralized system. The manufacturer claims that this system makes it possible for all lower track wheels to be lubricated in about a ten-minute period once a month.

These 80 and 100-hp crawlers were demonstrated with a complete line of matching equipment, including 1½ and 2-cubic-yard tractor-shovels; an angling dozer blade that can be angled hydraulically from the operator's seat; and a straight bulldozer that tips fore and aft and tilts for ditching and crowning work. All these motions are controlled hydraulically from the operator's seat.

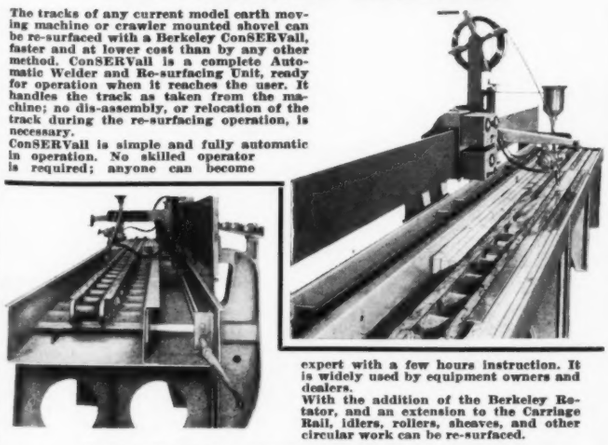
For further information write to J. I. Case Co., the Churubusco, Ind., Works, Churubusco, Ind., or use the Request Card at page 18. Circle No. 304.


## TRACK RE-SURFACING, fast and at low cost with a BERKELEY ConSERVall

The tracks of any current model earth moving machine or crawler mounted shovel can be re-surfaced with a Berkeley ConSERVall, faster and at lower cost than by any other method. ConSERVall is a complete Automatic Welder and Re-surfacing Unit, ready for operation when it reaches the user. It handles the track as taken from the machine; no dis-assembly, or relocation of the track during the re-surfacing operation, is necessary.

ConSERVall is simple and fully automatic in operation. No skilled operator is required; anyone can become expert with a few hours instruction. It is widely used by equipment owners and dealers.

With the addition of the Berkeley Retator, and an extension to the Carriage Rail, idlers, rollers, sheaves, and other circular work can be re-surfaced.



Write for illustrated circulars, complete specifications, and prices.

**PENN TOOL & MACHINE CO.**
Danville, Illinois

Builders of production welding machines, jigs and fixtures
An Affiliate of Berkeley Equipment Company

For more facts, use Reader-Reply Card opposite page 18 and circle No. 636



## On more and more construction equipment

## KOHLER ENGINES

## help keep performance up··· costs down

Wherever power equipment is used in construction, you'll see a steady increase in the number of Kohler Engines giving sturdy, reliable, cost-saving service.

Precision-built to Kohler quality standards, Kohler Engines insure full-rated power in a wide range of sizes, with maximum response to heavy loads, remarkable low speed performance, snappy all-weather starting. Large bore and modern short stroke cut engine friction, increase piston ring life, give utmost useable power. Fully anchored magneto has easily accessible outside breaker points. All models have liberal oil capacity—pressure lubrication on the two larger sizes, K330 and K660. The K660 has tapered roller bearings at both ends of the crankshaft, smaller models have ball bearings at both ends. Sturdy compact design provides low weight per H.P. output. Special silencer muffler and large capacity oil bath air cleaner lessen noise. Smooth, balanced operation reduces equipment vibration, cuts wear, prolongs life.

Kohler branch offices are located in 16 principal cities. Sales and service organizations throughout the country have parts available and will assist you in selecting a Kohler Engine best suited to your needs. Write for information.

**Modern short stroke • 4-cycle • Air-cooled**

K90—1.8 to 3.6 H.P.

K160—3.7 to 6.6 H.P.

K330—8.2 to 12.5 H.P.

K660—15 to 26.8 H.P. (2 cylinder opposed)

AN INVITATION . . . Visit the Kohler Co. display of engines and electric plants at the ARBA Road Show, International Amphitheatre, Chicago, January 28 through February 2. Booth 309, Avenue C, upstairs, North Hall.

Kohler Co., Kohler, Wisconsin • Established 1873

**KOHLER OF KOHLER**

PLUMBING FIXTURES • HEATING EQUIPMENT • ELECTRIC PLANTS
AIR-COOLED ENGINES • PRECISION CONTROLS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 637

# ROAD SHOW *INDEX*

## EARTHMOVING

**Acme Iron Works**
San Antonio, Texas
*South Hall downstairs, 610*

**Allis-Chalmers Mfg. Co.**
Milwaukee, Wis.
*South Hall downstairs, 601, 603, 621*

**American Hoist & Derrick Co.**
St. Paul, Minn.
*Arena, 505*

**American Tractor Corp.**
Churubusco, Ind.
*Donovan Hall, 827*

**Athey Products Corp.**
Chicago, Ill.
*Exposition Hall, 701, 720*

**Austin-Western Works, Baldwin-Lima-Hamilton Corp.**
Aurora, Ill.
*Exposition Hall, 702*

**Baldwin-Lima-Hamilton Corp.**
Lima, Ohio
*Arena, 506*

**Bay City Shovels, Inc.**
Bay City, Mich.
*Arena, 507*

**Wm. Bros Boiler & Mfg. Co.**
Minneapolis, Minn.
*North Hall downstairs, 415*

**Browning Mfg. Co.**
San Antonio, Texas
*Donovan Hall, 814*

**Bucyrus-Erie Co.**
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*Arena, 514*

**Buffalo-Springfield Roller Co.**
Springfield, Ohio
*Arena, 508*

**Ralph B. Carter Co.**
Hackensack, N. J.
*North Hall downstairs, 407*

**J. I. Case Co.**
Racine, Wis.
*Donovan Hall, 827*

**Caterpillar Tractor Co.**
Peoria, Ill.
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**Clark Equipment Co., Construction Machinery Div.**
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*Donovan Hall, 823, 829, 831*

**Clement-Braswell, Inc.**
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*North Hall downstairs, 417*

**Davey Compressor Co.**
Kent, Ohio
*Donovan Hall, 812*

**Deere & Co.**
Moline, Ill.
*Donovan Hall, 835*

**Eimco Corp.**
Salt Lake City, Utah
*South Hall downstairs, 617*

**Euclid Div., General Motors Corp.**
Cleveland, Ohio
*North Hall downstairs, 400, 402, 416*

**Ford Motor Co., Tractor & Implement Div.**
Birmingham, Mich.
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**Gorman-Rupp Co.**
Mansfield, Ohio
*Arena, 518;*
*South Hall downstairs, 600*

**W. E. Grace Mfg. Co.**
Dallas, Texas
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**Hanson Clutch & Machinery Co.**
Tiffin, Ohio
*Donovan Hall, 805*

**Harnischfeger Corp.**
Milwaukee, Wis.
*Arena, 510;*
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**Hendrix Mfg. Co.**
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**Hercules Galion Products, Inc.**
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**Frank G. Hough Co.**
Libertyville, Ill.
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**LeTourneau-Westinghouse Co.**
Peoria, Ill.
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**Link-Belt Speeder Corp.**
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**Unit Crane & Shovel Corp.**
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**Gradall Div., Warner & Swasey Co.**
Cleveland, Ohio
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**Wellman Engineering Co.**
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**Gar Wood Industries, Inc.**
Wayne, Mich.
*Exposition Hall, 700*

**Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc.**
Sunnyvale, Calif.
*North Hall downstairs, 420*

**Worthington Corp.**
Harrison, N. J.
*Exposition Hall, 733*

**This classified listing of Road Show exhibitors is published to give Contractors and Engineers readers a preview of who will be exhibiting and where their booth is located in the International Amphitheatre. Exhibitors are listed, according to their major products, under earthmoving, paving, general utility, components, attachments, maintenance, and materials and supplies.**

**Huber-Warco Co.**
Marion, Ohio
*Exposition Hall, 714*

**Ingersoll-Rand Co.**
New York, N. Y.
*Exposition Hall, 712*

**International Harvester, Construction Equipment Div.**
Chicago, Ill.
*Exposition Hall, 711 and 726*

**Jay Co.**
Columbus, Ohio
*South Hall upstairs, 213*

**Joy Mfg. Co.**
Pittsburgh, Pa.
*Donovan Hall, 800*

**Koehring Co.**
Milwaukee, Wis.
*Arena, 512*

**R. G. LeTourneau, Inc.**
Longview, Texas
*North Hall downstairs, 418;*
*Donovan Hall, 841*

**Parsons Co.**
Newton, Iowa
*Exposition Hall, 725*

**Perfection Steel Body Co.**
Galion, Ohio
*South Hall downstairs, 606*

**Pettibone Mulliken Corp.**
Chicago, Ill.
*Donovan Hall, 813*

**Renner Mfg. Co.**
Butler, Wis.
*North Hall upstairs, 319*

**Rice Pump & Machine Co.**
Belgium, Wis.
*North Hall upstairs, 332*

**Schield Bantam Co.**
Waverly, Iowa
*Exposition Hall, 731*

**Schramm, Inc.**
West Chester, Pa.
*Exposition Hall, 721*

**Seaman-Andwall Corp.**
Milwaukee, Wis.
*North Hall upstairs, 320 and 323*

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**Barber-Greene Co.**
Aurora, Ill.
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**Blaw-Knox Co., Construction Equipment Div.**
Mattoon, Ill.
*Exposition Hall, 727*

**L. Burmeister Co.**
Milwaukee, Wis.
*Donovan Hall, 847*

**Butler Bin Co.**
Waukesha, Wis.
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**Chain Belt Co.**
Milwaukee, Wis.
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**Clipper Mfg. Co.**
Kansas City, Mo.
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**Construction Machinery Co.**
Waterloo, Iowa
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**Cook Bros. Equipment Co.**
Los Angeles, Calif.
*North Hall downstairs, 410*

**F. D. Cummer & Son Co.**
Cleveland, Ohio
*North Hall upstairs, 340*

**Diamond Iron Works, Div. of Goodman Mfg. Co.**
Chicago, Ill.
*Donovan Hall, 837*

**Dotmar Industries, Inc.**
Kalamazoo, Mich.
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**Erie Strayer Co.**
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**E. D. Etnyre & Co.**
Oregon, Ill.
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**Gilson Bros. Co.**
Fredonia, Wis.
*South Hall upstairs, 215*

**Heltzel Steel Form & Iron Co.**
Warren, Ohio
*Exposition Hall, 719*

**Hetherington & Berner, Inc.**
Indianapolis, Ind.
*North Hall downstairs, 411*

**Highway Equipment Co., Inc.**
Cedar Rapids, Iowa
*North Hall upstairs, 347*

**Hy-Way Machinery, Inc.**
Youngstown, Ohio
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**Iowa Mfg. Co.**
Cedar Rapids, Iowa
*Exposition Hall, 723*

**Jackson Vibrators, Inc.**
Ludington, Mich.
*North Hall upstairs, 310*

**Jaeger Machine Co.**
Columbus, Ohio
*Exposition Hall, 704*

**Jeffrey Mfg. Co.**
Columbus, Ohio
*North Hall upstairs, 338*

**C. S. Johnson Co.**
Champaign, Ill.
*Exposition Hall, 725*

**Koehring Co.**
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**Kwik-Mix Co.**
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**Littleford Bros., Inc.**
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**Master Vibrator Co.**
Dayton, Ohio
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**Municipal Supply Co.**
South Bend, Ind.
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**Nordberg Mfg. Co.**
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**Pioneer Engineering Works, Inc.**
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**Standard Steel Corp.**
Los Angeles, Calif.
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**Standard Steel Works**
North Kansas City, Mo.
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Binghamton, N. Y.
*North Hall upstairs, 339*

**Texas Co., Asphalt Sales Div.**
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**White Mfg. Co.**
Elkhart, Ind.
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## GENERAL UTILITY

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**Barco Mfg. Co.**
Barrington, Ill.
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**Beech Aircraft Corp.**
Wichita, Kan.
*Donovan Hall, 817*

**Chevrolet Div., Commercial & Truck Dept., General Motors Corp.**
Detroit, Mich.
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**C. H. & E. Mfg. Co.**
Milwaukee, Wis.
*North Hall downstairs, 403*

**C. I. T. Corp.**
New York, N. Y.
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*North Hall upstairs, 354*

**Cleaver-Brooks Co.**
Milwaukee, Wis.
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**Dana Corp.**
Toledo, Ohio
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**Dart Truck Co.**
Kansas City, Mo.
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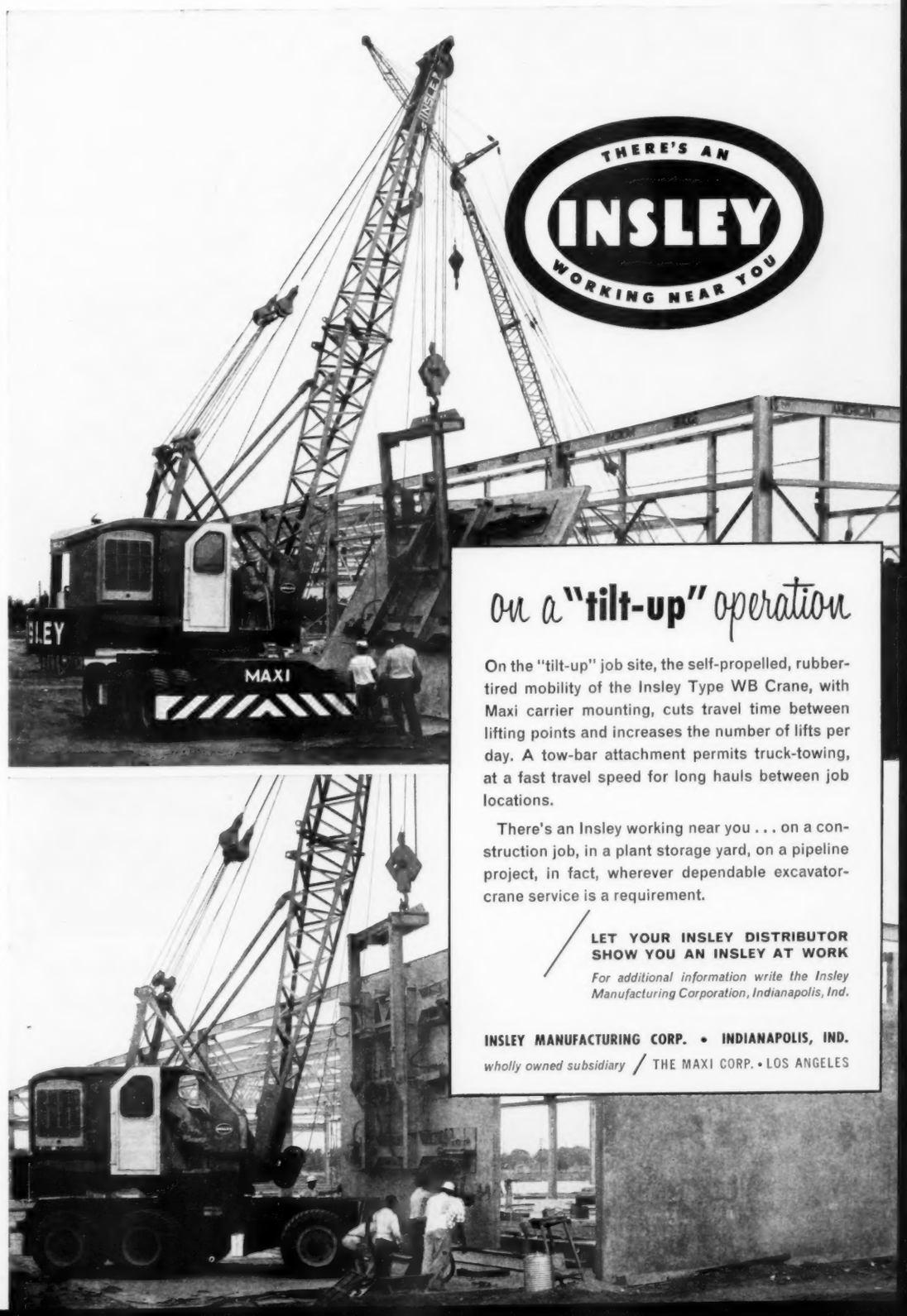


*on a* **"tilt-up"** *operation*

On the "tilt-up" job site, the self-propelled, rubber-tired mobility of the Insley Type WB Crane, with Maxi carrier mounting, cuts travel time between lifting points and increases the number of lifts per day. A tow-bar attachment permits truck-towing, at a fast travel speed for long hauls between job locations.

There's an Insley working near you . . . on a construction job, in a plant storage yard, on a pipeline project, in fact, wherever dependable excavator-crane service is a requirement.

**LET YOUR INSLEY DISTRIBUTOR SHOW YOU AN INSLEY AT WORK**

*For additional information write the Insley Manufacturing Corporation, Indianapolis, Ind.*

**INSLEY MANUFACTURING CORP. • INDIANAPOLIS, IND.**
*wholly owned subsidiary* / THE MAXI CORP. • LOS ANGELES


For more facts, circle No. 638→

(Continued from preceding page)

**R. E. Dietz Co.**
Syracuse, N. Y.
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**Ford Motor Co.**
Dearborn, Mich.
*Donovan Hall, 825*

**Freuhauf Trailer Co.**
Detroit, Mich.
*South Hall downstairs, 615*

**GMC Truck & Coach Div.**
Pontiac, Mich.
*North Hall downstairs, 406*

**Heil Co.**
Milwaukee, Wis.
*Donovan Hall, 806*

**Homelite Div., Textron American, Inc.**
Port Chester, N. Y.
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*North Hall downstairs, 401*

**Kohler Co.**
Kohler, Wis.
*North Hall upstairs, 309*

**Leschen Wire Rope Div., H. K. Porter Co.**
St. Louis, Mo.
*North Hall upstairs, 300*

**Lufkin Rule Co.**
Saginaw, Mich.
*North Hall upstairs, 301*

**McCarter Iron Works, Inc.**
Norristown, Pa.
*North Hall upstairs, 337*

**McKiernan-Terry Corp.**
Dover, N. J.
*South Hall downstairs, 608*

**Mack Trucks, Inc.**
Plainfield, N. J.
*Donovan Hall, 803*

**Macwhyte Co.**
Kenosha, Wis.
*South Hall upstairs, 211*

**Oshkosh Motor Truck Co.**
Oshkosh, Wis.
*South Hall downstairs, 607*

**Rodgers Hydraulics, Inc.**
Minneapolis, Minn.
*North Hall upstairs, 368*

**John A. Roebling's Sons Corp.**
Trenton, N. J.
*North Hall upstairs, 307*

**Union Chain & Mfg. Co.**
Sandusky, Ohio
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**Union Wire Rope Corp.**
Kansas City, Mo.
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**United States Steel Corp.**
Pittsburgh, Pa.
*Arena, 516*

**E. H. Wachs Co.**
Chicago, Ill.
*Donovan Hall, 821*

**Walter Motor Truck Co.**
Brooklyn, N. Y.
*South Hall downstairs, 616*

**White Motor Co.**
Cleveland, Ohio
*Donovan Hall, 811*

## COMPONENTS

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Jackson, Mich.
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**Allison Div., General Motors Corp.**
Indianapolis, Ind.
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**American Manganese Steel Div., American Brake Shoe Co.**
Chicago Heights, Ill.
*South Hall upstairs, 236*

**Buda Div., Allis-Chalmers Mfg. Co.**
Harvey, Ill.
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**Chicago Rawhide Mfg. Co.**
Chicago, Ill.
*South Hall upstairs, 224*

**Cleveland Graphite Bronze Co.**
Cleveland, Ohio
*North Hall upstairs, 350*

**Continental Motor Corp.**
Muskegon, Mich.
*North Hall upstairs, 329*

**Cummins Engine Co., Inc.**
Columbus, Ind.
*South Hall downstairs, 619*

**Detroit Diesel Engine Div., General Motors Corp.**
Detroit, Mich.
*Exposition Hall, 718*

**Dollinger Corp.**
Rochester, N. Y.
*South Hall upstairs, 207*

**Electric Wheel Co.**
Quincy, Ill.
*South Hall upstairs, 204*

**Fuller Mfg. Co., Transmission Div.**
Kalamazoo, Mich.
*South Hall upstairs, 221*

**Hercules Motor Corp.**
Canton, Ohio
*North Hall downstairs, 408*

**Hyatt Bearing Div., General Motors Corp.**
Harrison, N. J.
*North Hall upstairs, 303*

**Kalamazoo Div., New York Air Brake Co.**
Kalamazoo, Mich.
*North Hall upstairs, 370*

**Kensington Steel Co.**
Chicago, Ill.
*Donovan Hall, 840*

**Morse Chain Co., Borg-Warner Corp.**
Ithica, N. Y.
*Donovan Hall, 822*

**Murphy Diesel Co.**
Milwaukee, Wis.
*South Hall downstairs, 614*

**Rockford Clutch Div., Borg-Warner Corp.**
Rockford, Ill.
*North Hall upstairs, 362*

**SKF Industries, Inc.**
Philadelphia, Pa.
*South Hall upstairs, 203*


# 'KOLMAN Conveyor-Screen Plant Increased our Production 65% on Sticky Crushing Job'

50-ft. Kolman Model 101 with 36" belt shown separating fines on Hopkins Construction Ltd. job near Edmonton, Alta. Equipped with Model 5B-80 Kolman single-deck screen and feeder-trap combination

KOLMAN
COMPLETELY PORTABLE
CONVEYOR-SCREEN PLANT
CONVEYOR · SCREEN · TRAP · FEEDER

## Hopkins Construction Ltd. Thanks a Kolman for Preventing Operating Loss

Hopkins Construction Ltd., Lacombe, Alberta, began a crushing job near Edmonton on which they were required to produce about 40,000 tons of ¾" gravel. This was to be taken from a stockpile of pit run gravel. Their examination of the material indicated an average crush which they thought could be completed without difficulty.

"But when work commenced," said C. D. Marble, "we encountered about a foot beneath the surface exceptionally sticky fines which cut our production to not more than 50%. Regardless of what adjustments we made in our equipment we could effect no improvement. The gummy fines adhered to anything they touched.

"We solved the problem by introducing a Kolman 50'x36" conveyor with vibrating screen. It succeeded in separating the sticky fines from the rock which was passed directly to the crusher and also fed the fines back to the conveyor belt in a manner which resulted in good blending. Our production increased about 65% immediately. As a result the job was completed in good time, where otherwise it would have lasted considerably longer and resulted in an operating loss to ourselves."

Hopkins Construction Ltd. is just one of hundreds of contractors who are discovering Kolman has the combination for low-cost, high production screening and loading. Many have used set-ups similar to that pictured here to speed up their production by preliminary screening ahead of the crusher.

The Kolman Model 101 is available in belt widths from 18" to 42" and up to 60-ft. lengths on portable plants. It's capable of carrying either a single, double or triple-deck vibrating screen without additional support, and can be equipped with a dozer trap, casting hopper, feeder-trap, or feeder-hopper. Adaptable to any type of feeding — dozer, dragline, shovel, front-end loader and others. Best of all, the Kolman 101 costs less than comparable heavy-duty conveyors.

WRITE FOR LITERATURE, PRICES, AND NAME OF NEAREST DEALER

**KOLMAN Manufacturing Co.**
4922 West 12th St., Sioux Falls, S. D.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 639

THIS IS THE .... Air Tumbler

*the master of* DUST *in industry* ★ ★ ★

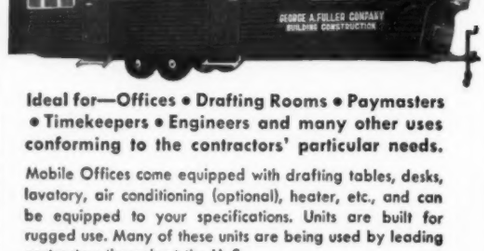
SIMPLE — DEPENDABLE
NO FIRE HAZARD
HIGH EFFICIENCY
CONSTANT CAPACITY
LOW OPERATING COST

WRITE FOR BULLETIN NO. 531

**DUST SUPPRESSION & ENGINEERING COMPANY**
P. O. BOX 67 • LAKE ORION, MICHIGAN

For more facts, circle No. 640

# Leading Contractors Demand the Genuine "Mobile Office"




**Ideal for—Offices • Drafting Rooms • Paymasters • Timekeepers • Engineers and many other uses conforming to the contractors' particular needs.**

Mobile Offices come equipped with drafting tables, desks, lavatory, air conditioning (optional), heater, etc., and can be equipped to your specifications. Units are built for rugged use. Many of these units are being used by leading contractors throughout the U. S.

Write today and get the complete facts on how mobile units can work for you.

**MOBILE OFFICE, INCORPORATED**
7300 Stony Island Avenue, Chicago 49, Illinois
PHONES DOrchester 3-1048-9

For more facts, circle No. 641

**STOP that WATER**
With FORMULA No. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—hold 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs. Applied quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

**Timken-Detroit Axle Div., Rockwell Spring & Axle Co.**
Detroit, Mich.
*North Hall upstairs, 364*

**Timken Roller Bearing Co.**
Canton, Ohio
*Donovan Hall, 816*

**Torrington Co.**
South Bend, Ind.
*Donovan Hall, 808*

**Twin Disc Clutch Co.**
Racine, Wis.
*North Hall downstairs, 413*

**Vickers, Inc.**
Detroit, Mich.
*South Hall upstairs, 219*

**Waukesha Motor Co.**
Waukesha, Wis.
*South Hall upstairs, 231*

**Weatherhead Co., Fort Wayne Div.**
Fort Wayne, Ind.
*North Hall upstairs, 532*

**Wisconsin Motor Corp.**
Milwaukee, Wis.
*North Hall upstairs, 304*

## ATTACHMENTS

**Electric Steel Foundry Co.**
Portland, Ore.
*North Hall downstairs, 404*

**Fleco Corp.**
Jacksonville, Fla.
*Exposition Hall, 701 and 720*

**Gledhill Road Machinery Co.**
Galion, Ohio
*North Hall upstairs, 335*

**Good Roads Machinery Corp.**
Minerva, Ohio
*North Hall upstairs, 314*

**Hyster Co.**
Portland, Ore.
*Exposition Hall, 701 and 720*

**Pacific Car & Foundry Co.**
Chicago, Ill.
*Exposition Hall, 711 and 726*

**Preco, Inc.**
Los Angeles, Calif.
*Exposition Hall, 701 and 720*

**Superior Equipment Co.**
Bucyrus, Ohio
*Exposition Hall, 711 and 726*

**Tractomotive Corp.**
Deerfield, Ill.
*South Hall downstairs, 601, 603, 621*

**Wain-Roy Corp.**
Hubbardston, Mass.
*Exposition Hall, 711 and 726*

## MAINTENANCE

**American Bosch Div., American Bosch Arma Corp.**
Springfield, Mass.
*South Hall upstairs, 230*

**D-A Lubricant Co., Inc.**
Indianapolis, Ind.
*North Hall downstairs, 421*

**Eastman Mfg. Co.**
Manitowoc, Wis.
*North Hall upstairs, 359*

**Fiske Bros. Refining Co., Lubriplate Div.**
Newark, N. J.
*South Hall upstairs, 48, 49, 50*

**Purolator Products, Inc.**
Rahway, N. J.
*South Hall upstairs, 202*

**Stewart-Warner Corp., Alemite Div.**
Chicago, Ill.
*North Hall upstairs, 353*

**S. K. Wellman Co.**
Bedford, Ohio
*North Hall upstairs, 334*

*(Continued on next page)*

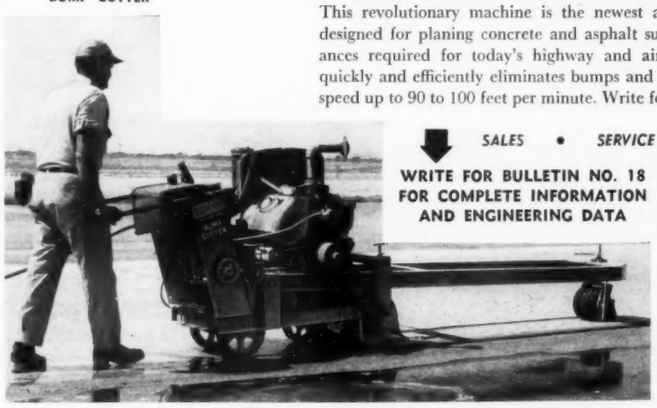

## • • CONCUT • • CONCRETE SAWS and CONCRETE BUMP CUTTER

The CONCUT line includes:
MODEL R-85 LIGHTWEIGHT CONCUT
MODEL S-200 STANDARD CONCUT
MODEL SP-300 Self-Propelled CONCUT
MODEL 1200 and 2400 JOINTMASTER SAWING MACHINES
CONCUT Precision BUMP CUTTER

There's a CONCUT Concrete Sawing Machine for every concrete and asphalt sawing job. The complete CONCUT line includes the lightweight CONCUT for sawing concrete and asphalt at depths up to 3", the standard CONCUT, the heavy duty self-propelled machine with a 36 HP engine, the big JOINTMASTER Sawing Machine, and now the new CONCUT Precision Bump Cutter. Recent improvements in design and operating features make the CONCUT line even more outstanding in low-cost operation, dependable performance and increased blade economy.

### THE NEW CONCUT Precision BUMP CUTTER (Pat. App. For)

This revolutionary machine is the newest addition to the CONCUT line. It is designed for planing concrete and asphalt surfaces to comply with the close tolerances required for today's highway and airports. The CONCUT Bump Cutter quickly and efficiently eliminates bumps and rough places . . . operates at a cutting speed up to 90 to 100 feet per minute. Write for details.



SALES • SERVICE • CONTRACT SAWING

WRITE FOR BULLETIN NO. 18 FOR COMPLETE INFORMATION AND ENGINEERING DATA

SPECIALISTS in the field of CONCRETE SAWING

*Distributor and Dealer Inquiries Invited*

**CONCRETE SAWING EQUIPMENT INC.**
331 N. SANTA ANITA AVE.
ARCADIA, CALIFORNIA, U.S.A.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 642

## GARRISON power steering gives agility to LORAIN'S rugged 4-AXLE MOTO-CRANE!

**Garrison Power Steering is standard equipment on this big, four-axle 8-wheel (8x4) Lorain Moto-Crane, available in 22½, 25, 30 and 35 ton models.**

The tandem front axles supply 4 tires to improve front end weight distribution and thus better the machine flotation and maneuverability for off-the-road and on-the-job travel. The 4 front wheels are steered simultaneously and in the correct geometry for proper tracking . . . such steering is accomplished with only slight pressure on the steering wheel . . . thanks to Garrison Power Steering.

With hydraulic power doing 80% of the work of turning, operators tire less easily, do more work in a day's time. Important, too, shock from rubble, rough ground, etc., is absorbed by the hydraulic booster, adding life to the steering mechanism.

*Since Garrison Power Steering is available as optional equipment on all Lorain Cranes where it is not standard equipment, why not make sure you get its advantages on your next rig?*

**GARRISON** Manufacturing Co.

**POWER STEERING KITS AVAILABLE**—Garrison Power Steering is available as optional equipment on most makes and models of trucks, wheeled off-the-road equipment, and tractors, and material handling equipment. Write for complete information.

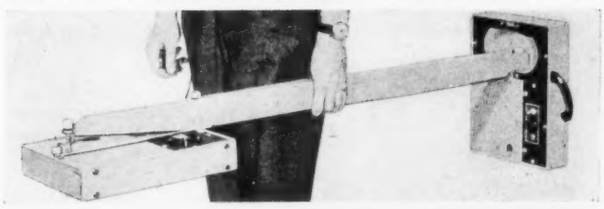
4609 E. Sheila Street, Los Angeles **22**, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 643

## WILKINSON LINE LOCATOR FOR GREATER PROFITS . . .

### . . . IN YOUR HIGHWAY GRADING and DITCHING OPERATIONS

1. Spots all pipe and cable locations before uncovering preventing damage, expensive repairs and lost time.
2. Indicates depth too.
3. Leading contractors everywhere use it to reduce job costs and speed excavating operations.



**WILKINSON PRODUCTS COMPANY**
3987 Chevy Chase Drive — Pasadena 3, California — SYlvan 0-4314

For more facts, use Reader-Reply Card opposite page 18 and circle No. 644

# *It's the PREHY*

## Grouter & Placer

(in the size and model to meet your job requirements).

that affords BIG SAVINGS and a job well done.

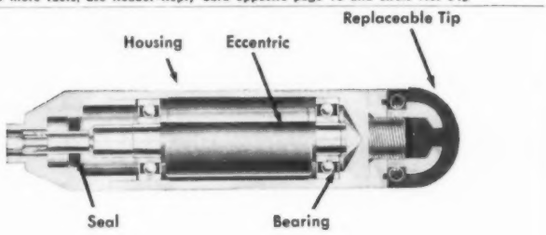
★ ★ ★

A machine for every need — from the hand pump grouting-in of reinforcing rods, all types of grouting and soil stabilization, to pneumatic placing of ¾" aggregate mixes.

Write for circular describing full line of PREHY equipment and accessories.

**PREHY COMPANY** 420 Lexington Ave., New York 17, N. Y.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 645

**SIMPLE DESIGN** — Short head Viber vibrators are simple in design and have few parts as indicated in cut-away picture above. Head assembly with replaceable rubber tip is shown at left. Assembly with 3-finned steel-cast tip at right.

# Short Head Viber Vibrators Offer Major Advantages in Placement of Concrete

VIBER VIBRATOR heads are short, easy to manipulate—simple, easy to maintain. Simple construction of the Viber head makes a compact assembly which maneuvers easily around steel and into awkward, hard-to-reach places.

The Viber design utilizes a single eccentric weight in a heat-treated alloy steel housing. Other parts are one bearing at each end of the weight and a grease seal. Viber patented replaceable rubber tip is standard equipment, with 3-finned steel cast tip optional.

Viber heads are light weight, ranging from 6 to 16 pounds . . . 11 to 12 inches in length and are available in four diameters — 1¾ in., 2⅛ in., 2½ in. and 3 in.

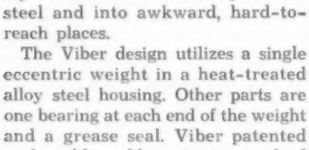
Flexible shaft driven, Viber vibrators are powered by electricity, gasoline or air . . . easily adapted to varying job conditions. They are high speed, operating at speeds between 8500 and 11,000 rpm.

### Viber Replaceable Rubber Tips

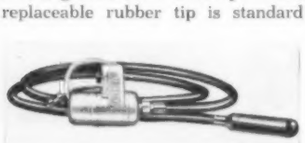
Viber rubber tips save contractors thousands of dollars yearly by preventing damage to forms of plywood and other expensive materials. In addition, since most wear on a vibrator occurs on the end of the housing, use of replaceable rubber tips greatly extends housing life.

Viber vibrators are effective. More work can be done in less time and with minimum danger of damage to forms by using the high speed low amplitude type of vibrator pioneered by VIBER.

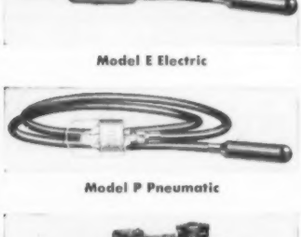
For complete information on Viber vibrators and address of nearest distributor, write Viber Company, 726 South Flower St., Burbank, Calif. Dept. 17E1.



Model E Electric



Model P Pneumatic



Model G Gasoline

VIBRATORS SINCE 1931

For more facts, use Reader-Reply Card opposite page 18 and circle No. 646

(Continued from preceding page)

## MATERIALS AND SUPPLIES

*(South Hall Upstairs)*

**Abrams Aerial Survey Corp.**
Lansing, Mich.
*103*

**Acme Highway Products Corp.**
Buffalo, N. Y.
*106*

**Aluminum Co. of America**
Pittsburgh, Pa.
*14 through 20*

**American Bitumuls & Asphalt Co.**
San Francisco, Calif.
*81–82*

**American Concrete Pipe Association**
Chicago, Ill.
*25*

**American Marietta Co.**
Chicago, Ill.
*71 through 74*

**American Sisalkraft Corp.**
Attleboro, Mass.
*26*

**Anchor Post Products Co.**
Baltimore, Md.
*100*

**Armco Drainage & Metal Products, Inc.**
Middletown, Ohio
*107*

**Asphalt Institute**
College Park, Md.
*77–78*

**Barrett Div., Allied Chemical & Dye Corp.**
New York, N. Y.
*9*

**Bendix Computer Div., Bendix Aviation Corp.**
Los Angeles, Calif.
*8*

**Bethlehem Steel Co., Inc.**
Bethlehem, Pa.
*55 through 58; 63 through 66*

**Calcium Chloride Institute**
Washington, D. C.
*24*

**Carolina Tire Co.**
Salisbury, N. C.
*5–6*

**Cataphote Corp.**
Toledo, Ohio
*67–68*

**Columbia-Southern Chemical Corp.**
Pittsburgh, Pa.
*61–62*

**Poz O-Pac Co. of America (G. & W. H. Corson)**
Plymouth Meeting, Pa.
*80*

**Food Machinery & Chemical Corp.**
Lakeland, Fla.
*88*

**L. B. Foster Co.**
New York, N. Y.
*59–60*

**General Electric Co.**
Schenectady, N. Y.
*41–42*

(Continued on next page)


*Announcing*

## The NEW Joint Saw Company

Patented

## LIGHT-WEIGHT MULTIPLE-BLADE JOINT SAWS

for Spring delivery . . .

Self-propelled and Self-trailed. Completely HYDRAULICALLY powered and operated thus insuring longer blade life. Diamond or abrasive blades. Will saw widths from 12 to 25-feet. A revolutionary new profit making saw for sawing weakened plane joints in highway and airport runways, aprons and taxiways.

*Write for complete leasing arrangements and illustrated brochures.*

**JOINT SAW COMPANY**
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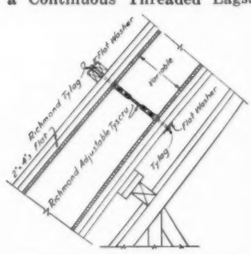
For more facts, circle No. 647

# Concreting Achievement

### Non-parallel forms supported by Richmond Adjustable Tyscrus

To pour the continuously curved shell of the unique MIT auditorium—it thickens from 3½" at the center to over 10" at the supports—George A. Fuller Company built an inner form on elaborate scaffolding. On the lower 25 feet of the shell, the outer forms were supported on the inner ones by Richmond Adjustable Tyscrus.

The Adjustable Tyscrus were assembled by threading a pair of standard Richmond Tyscrus — resistance welded for heavy work—on the ends of a Continuous Threaded Lagstud.




GEORGE A. FULLER COMPANY FORM DETAIL

These kept the non-parallel forms in perfect alignment while the pour was made. Assembly as well as stripping of forms was speeded by the coarse, helical-coil thread of the Tyscrus.

Send for new Richmond Handbook which tells how to pour concrete quickly and economically. It will save you time and money on your next job. Write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Avenue, Brooklyn 8, N. Y. or 315 So. 4th St., St. Joseph, Mo.

For more facts, circle No. 648

(Continued from preceding page)


**Grote Mfg. Co.**
Bellevue, Ky.
*33–34*

**Habitant Fence, Inc.**
Bay City, Mich.
*47*

**International Resources, Engineering, and Exploration Group**
New York, N. Y.
*13*

**International Salt Co., Inc.**
Scranton, Pa.
*105*

**Irving Subway Grating Co., Inc.**
Long Island City, N. Y.
*32*

**Kaiser Aluminum & Chemical Sales, Inc.**
Oakland, Calif.
*83–84*

**Koppers Co., Inc., Tar Products Div.**
Pittsburgh, Pa.
*28 through 30*

**Liberty Mutual Insurance Co.**
Boston, Mass.
*10*

**Minnesota Mining & Mfg. Co.**
St. Paul, Minn.
*89–90; 95–96*

**Monroe Calculating Machine Co., Inc.**
Orange, N. J.
*38–39*

**Monsanto Chemical Co.**
St. Louis, Mo.
*85–86*

**Morton Salt Co.**
Chicago, Ill.
*87*

**Motorola Communications & Electronics, Inc.**
Chicago, Ill.
*108*

**Nafisco, Inc.**
Chicago, Ill.
*109*

**National Crushed Limestone Institute**
Washington, D. C.
*110*

**National Slag Association**
Washington, D. C.
*70*

**Nelson Stud Welding Div., Gregory Industries, Inc.**
Lorain, Ohio
*97–98*

**Philip Carey Mfg. Co.**
Cincinnati, Ohio
*7*

**Radio Corp. of America**
Camden, N. J.
*23*

**Remington Arms Co.**
Bridgeport, Conn.
*3*

**Reynolds Metals Co.**
Louisville, Ky.
*91 through 94*

**Servicised Products Corp.**
Chicago, Ill.
*104*

**Sinclair Refining Co.**
New York, N. Y.
*21–22*

**Sonoco Products Co.**
Hartsville, S. C.
*35–36*

**Sterling Bolt Co.**
Chicago, Ill.
*1–2*

**Swing-Lo Suspended Scaffold Co.**
Covert, Mich.
*69*

**Syro Steel Co.**
Girard, Ohio
*53–54*

**Toncan Culvert Manufacturers Association, Inc.**
Cleveland, Ohio
*79*

**Universal Sewer Pipe Corp.**
Cleveland, Ohio
*75–76*

**Vibration Measurement Engineers**
Chicago, Ill.
*99*

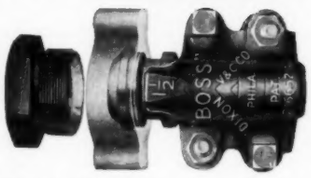
**Wire Reinforcement Institute**
Washington, D. C.
*101–102*

**Wood Conversion Co.**
St. Paul, Minn.
*27*


A listing of the AED Condex exhibitors appears on the next page.


Safest Connections for Pile Driver Hose
AND OTHER STEAM, AIR, WATER AND HYDRAULIC APPLICATIONS

"GJ-BOSS"
GROUND-JOINT FEMALE COUPLING STYLE X-34



The original *washerless* coupling that is unequalled for *safety* in every high pressure service, and will therefore serve with exceptional efficiency and economy on all low-pressure applications. Built to withstand hard use and rough handling. Ground-joint union between stem and spud provides leak-proof, trouble-free seal...no lost or worn-out washers to replace. All parts malleable iron or steel, thoroughly rustproofed. Furnished with super-strong "Boss" Offset and Interlocking Clamps. Sizes ¼" to 6", inclusive.

COMPANION MALE COUPLING
"BOSS", STYLE MX-16

Companion coupling for "GJ-Boss", described above, and "Boss" Washer Type Couplings Style W-16. Will prove equally efficient and economical for all applications where standard iron pipe nipples are normally used. Each size fits same size hose . . . oversize hose not required. Coupling consists of I.P.T. male stem and "Boss" Offset and Interlocking Clamp. Steel or malleable iron, thoroughly rustproofed. Sizes ¼" to 6", inclusive.

*Stocked by Manufacturers and Distributors of Mechanical Rubber Goods*

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For more facts, circle No. 649

Your BEST BUY
UNUSED ORIGINAL GOV'T SURPLUS NEW-GUARANTEED 6 x 6's

CALL COLLECT to Sid Lieberman or Rich Medlock, for the best TRUE VALUE—Quality as well as Price.
SATISFACTION GUARANTEED
World's Largest Dealer of Unused Gov't Surplus Trucks
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PHONE TE 5-4477 SPECIALIZING IN
TANDEM ALL WHEEL DRIVE 6X6 TRUCKS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 650

Davey Rotary Drill on James E. Hoffman job near Karthaus, Pa.

cut drilling costs on every construction job!

DAVEY
Rotary Drills

On every big construction job, you can speed drilling . . . cut the costs of blast holes, structure testing, core drilling—with Daveys!

Davey Rotary Drills are suitable for mounting on any truck . . . move fast between jobs . . . are easy to set in drilling position. They are available in 6 different models—air blast, mud pump, or combination types. Rated capacities to 2,000 ft. Features include choice of power take-off or separate power unit operation, automatic hydraulic feed, hydraulic pull down, heavy-duty rotary table, rugged tubular box-type mast.

AA-1700

*Write for full details!*

DAVEY
pioneers of "air-cooled air"
DAVEY COMPRESSOR CO. • KENT, OHIO

For more facts, use Reader-Reply Card opposite page 18 and circle No. 651

RENT... THE ORIGINAL
*Neo-Flasher*
ALL METAL FULLY SCOTCHLITED BARRICADE
FOR NO MORE THAN THE COST OF OPERATING ONE KEROSENE TORCH!
OUR SERVICE IS DEPENDABLE!

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NO MESSY KEROSENE • NO WEEK-END PREMIUM LABOR

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**NEO-FLASHER MANUFACTURING COMPANY**
3210 Vahalla Drive, Burbank, California

For more facts, use Reader-Reply Card opposite page 18 and circle No. 652

the key to lasting keyed joints...
*the*
**ECONOMICAL ANSWER**
*for*
LONGITUDINAL CENTER STRIPS
TRANSVERSE CONSTRUCTION JOINTS

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**TONGUE and GROOVE JOINT**

***DURABLE IN SERVICE:***
Preformed mastic composition absorbs expansion of slab—without extrusion. An effective, efficient bearing surface between slabs to prevent spalling at joint surfaces. Won't rust or rot.

***RIGID:***
More than sufficient strength to resist deforming forces of concrete placement . . . yet lightweight and easy to install.

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Won't rust or rot; absorbs no more than 8% water by test.

***ECONOMICAL:***
Less expensive than steel. Proved over the years on the basis of its high efficiency as load transferring medium.

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PRESSTITE Sealing Compounds
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# AED CONDEX* Exhibitors

**Air Placement Equipment Co.**
Kansas City, Mo.
*Exhibition Hall, 106*

**Allied Steel & Tractor Products, Inc.**
Cleveland, Ohio
*Exhibition Hall, 37*

**Allied Tractor Equipment Co.**
Seattle, Wash.
*Annex, 210*

**American Road Equipment Co.**
Omaha, Nebr.
*Exhibition Hall, 2–3–4*

**American Scale & Vise Co.**
Kansas City, Mo.
*Lower Lobby, 185*

**Anderson Engineering Co.**
Cambridge, Mass.
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**Atlas Conveyor Co.**
Clintonville, Wis.
*Exhibition Hall, 124*

**Automatic Devices, Inc.**
St. Louis, Mo.
*Exhibition Hall, 126*

**Avery Tractor, Inc.**
West Lebanon, N. Y.
*Exhibition Hall, 116–117; 140–141*

**Barnes Mfg. Co.**
Mansfield, Ohio
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**Beaver-Advance Corp.**
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*Exhibition Hall, 109*

**Briggs & Stratton Corp.**
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*Lower Lobby, 46*

**Brunner & Lay, Inc.**
Philadelphia, Pa.
*Exhibition Hall, 99, 102*

**Buck Equipment Corp.**
Cincinnati, Ohio
*Exhibition Hall, 132*

**Bucyrus Blades, Inc.**
Bucyrus, Ohio
*Lower Lobby, 100*

**The Burch Corp.**
Crestline, Ohio
*Exhibition Hall, 95*

**Campbell Equipment Co.**
Chicago, Ill.
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**Carver Pump Co.**
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*Exhibition Hall, 56*

**Champion Mfg. Co.**
St. Louis, Mo.
*Exhibition Hall, 25–26–27*

**The Charles Machine Works**
Perry, Okla.
*Exhibition Hall, 130*

**Chausse Mfg. Co., Inc.**
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**Chicago Pneumatic Tool Co. Construction Equipment Div.**
New York, N. Y.
*Exhibition Hall, 73, 75*

**C. I. T. Corp.**
New York, N. Y.
*Exhibition Hall, 5*

**The Colorado Fuel & Iron Corp.**
New York, N. Y.
*Exhibition Hall, 119*

**Dart Mfg. & Sales Co.**
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*Exhibition Hall, 41*

**Davey Compressor Co.**
Kent, Ohio
*Exhibition Hall, 35–36; 57–58*

**Delaware Tool Steel Corp.**
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*Exhibition Hall, 145*

**DeWalt, Inc.**
Lancaster, Pa.
*Exhibition Hall, 160–161*

**Dewey Bros.**
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*Lower Lobby, 181*

**Engineered Equipment, Inc.**
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**Essick Mfg. Co., Machinery Division**
Los Angeles, Calif.
*Exhibition Hall, 73; 75*

*(Continued on next page)*

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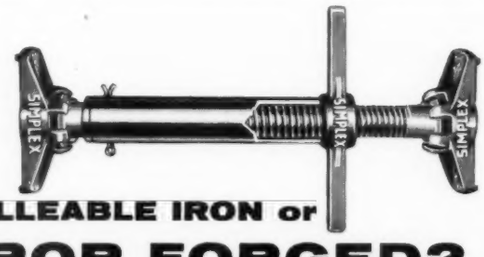


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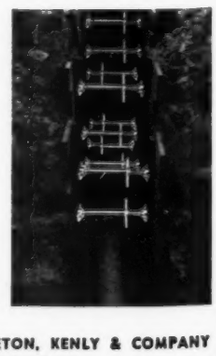

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**Robert G. Evans Co.**
Kansas City, Mo.
*Exhibition Hall, 122–123*

**Eveready Briksaw Co.**
Chicago, Ill.
*Exhibition Hall, 146–147–148*

**Felker Mfg. Co.**
Torrance, Calif.
*Exhibition Hall, 93–94*

**Flink Co.**
Streator, Ill.
*Exhibition Hall, 30*

**Gar-Bro Mfg. Co.**
Los Angeles, Calif.
*Exhibition Hall, 50–51–52*

**Gruendler Crusher & Pulverizer Co.**
St. Louis, Mo.
*Annex, 217, 218*

**H & L Tooth Co.**
Montebello, Calif.
*Annex, 203*

**Hamilton Rubber Mfg. Co.**
Trenton, N. J.
*Exhibition Hall, 136*

**Insto-Gas Corp.**
Detroit, Mich.
*Exhibition Hall, 135*

**International Vibration Co.**
Cleveland, Ohio
*Annex, 231*

**The Jay Corp.**
Columbus, Ohio
*Exhibition Hall, 15–16*

**Jones Superior Machine Co.**
Chicago, Ill.
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**Joost Mfg. Co.**
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*Annex, 227–228*

**Kalamazoo Mfg. Co.**
Kalamazoo, Mich.
*Exhibition Hall, 110*

**Kelley Machine Div., Wiesner-Rapp Co., Inc.**
Buffalo, N. Y.
*Lower Lobby, 74*

**Jos. F. Keisler Co.**
Chicago, Ill.
*Annex, 234*

**King Mfg. Corp.**
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*Exhibition Hall, 92*

**Kolman Mfg. Co.**
Sioux Falls, S. Dak.
*Annex, 226*

**LeRoi Div., Westinghouse Air Brake Co.**
Milwaukee, Wis.
*Exhibition Hall, 53–54–55*

**P. K. Lindsay Co.**
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**Little Giant Crane & Shovel, Inc.**
Des Moines, Iowa
*Annex, 233*

**Little Giant Products, Inc.**
Peoria, Ill.
*Exhibition Hall, 90; 111*

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Minneapolis, Minn.
*Exhibition Hall, 67–68; 80–81*

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Mansfield, Ohio
*Annex, 215–216; 221–222*

**Mall Tool Co.**
Chicago, Ill.
*Exhibition Hall, 83–84–85*

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**Miller Spreader Corp.**
Youngstown, Ohio
*Exhibition Hall, 107–108*

**Mobile Drilling, Inc.**
Indianapolis, Ind.
*Exhibition Hall, 88*

**Monarch Road Machinery Co.**
Grand Rapids, Mich.
*Annex, 204*

**Morgen Mfg. Co.**
Yankton, S. Dak.
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**Morse-Starrett Products Co.**
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**Sam Mulkey Co.**
Lee's Summit, Mo.
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**Neo-Flasher Mfg. Co.**
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**Ottwa Steel Div., L. A. Young Spring & Wire Corp.**
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**Power-Pack Conveyor Co.**
Cleveland, Ohio
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**The Ready-Power Co., Power Plant Div.**
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*Annex, 232*

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*Exhibition Hall, 66*

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*A Versatile Tool for MAXIMUM COMPACTION of*

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(Continued from preceding page)

**Sasgen Derrick Co.**
Chicago, Ill.
*Exhibition Hall, 1*

**Sauerman Bros., Inc.**
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*Lower Lobby, 182*

**Scheu Products Co.**
Upland, Calif.
*Exhibition Hall, 159*

**Sherman Products, Inc.**
Royal Oak, Mich.
*Exhibition Hall, 62*

**Shunk Mfg. Co.**
Bucyrus, Ohio
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**The T. L. Smith Co.**
Milwaukee, Wis.
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**Southwest Welding & Mfg. Co.**
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**Stedt Hydraulic Crane Co.**
Brookline, Mass.
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**Symons Clamp & Mfg. Co.**
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**Thermoid Co.**
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*Exhibition Hall, 134*

**Thrun Mfg. Co.**
Minneapolis, Minn.
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**Tubular Structures Corp. of America**
Los Angeles, Calif.
*Exhibition Hall, 6–7–8*

**Universal Form Clamp Co.**
Chicago, Ill.
*Exhibition Hall, 13–14*

**Upson-Walton Co.**
Cleveland, Ohio
*Exhibition Hall, 131*

**Vascoloy-Ramet Corp.**
Waukegan, Ill.
*Annex, 206*

**Viber Co.**
Burbank, Calif.
*Exhibition Hall, 133*

**Vibro-Plus Corp.**
Stanhope, N. J.
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**Vulcan Iron Works, Inc.**
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**Vulcan Tool Mfg. Co.**
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**Wayne Mfg. Co.**
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**H. Wenzel Tent & Duck Co.**
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**West Brick Buggy Corp.**
Cleveland, Ohio
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**Western Welding & Mfg. Corp.**
Milwaukee, Wis.
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**L. B. White Co.**
Onalaska, Wis.
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**Whiteman Mfg. Co.**
Los Angeles, Calif.
*Exhibition Hall, 20–21–22–23*

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Lynwood, Calif.
*Exhibition Hall, 142–143–144*

**Wire Rope Corp. of America**
St. Joseph, Mo.
*Exhibition Hall, 139*

**Wright Power Saw & Tool Corp.**
Sheboygan, Wis.
*Exhibition Hall, 29*

**Wylie Mfg. Co., Inc.**
Oklahoma City, Okla.
*Exhibition Hall, 149–150*

**Wyzenbeek & Staff, Inc.**
Chicago, Ill.
*Annex, 230*

**Yaun Mfg. Co.**
Baton Rouge, La.
*Exhibition Hall, 19*

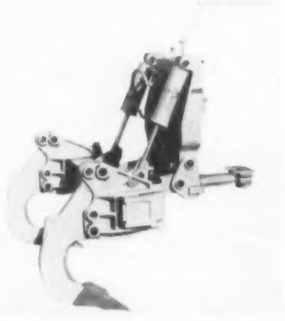
## Heavy-duty rock ripper features improved shanks

■ A new line of heavy-duty tractor-mounted rock rippers featuring improvements in the shank design is announced by the American Tractor Equipment Corp. An exclusive drawbar mounting arrangement lets the Ateco drawbar take the brunt of the pull, protecting the tractor transmission case against damage.

The new curved shanks are specially contoured and are fabricated of manganese-moly steel, heat-treated four times for strength and toughness. The points are replaceable and have splitting wedges. The underground "quiver" of the curved shanks is said to work like a jackhammer to shatter rock and shale.

An optional direct-drive pump permits continuous hydraulic power for ripper control, unaffected by clutch or torque transmission operation. The tool beam is of a welded-box design in which solid steel, not the weld, takes the strain.

For further information write to the American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 252.



Improvements in shank design and an exclusive drawbar mounting arrangement that protects the tractor transmission case are among the features of the new line of Ateco heavy-duty rack rippers.

*Visit the American Tractor Equipment Corp. at the Road Show in the International Amphitheatre, Booth 827.*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There are many practical, diversified uses for Miller Swivels, in capacities from 700 lbs. to 250 ton. 16 different styles in stock . . . special adaptations designed on request.
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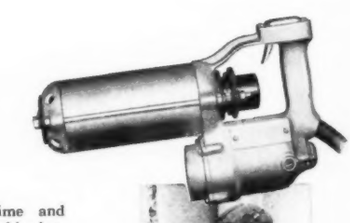
*SYNTRON*
**Self-Rotating**
**ELECTRIC HAMMERS**



Syntron Electric Hammers save time and lower job costs drilling, cutting, chipping, scaling paint, etc. Designed and built for continuous, trouble-free operation day after day even on the toughest jobs with a minimum of maintenance. There are no gears, cams, etc. to cause down time. Maintenance is low cost and simple. Available in capacities from 5/8" to 2". Also available with same capacities SYNTRON Electric Hammer Drills with automatic bit rotation.

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*Lays a Narrow Strip or Full Traffic Lane*

Handles all granular materials — salt, cinders, sand, calcium chloride, rock chips. Spreads at speeds up to 30 M.P.H. Clutch-controlled flow: steady or intermittent for hills and intersections.

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**SWENSON SPREADER & MFG. CO.**
LINDENWOOD, ILLINOIS

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# distributor doings

U. S. and Canadian dealer representatives watch Highway Trailer's earth-boring machines in action during the two-day distributor's sales conference held by the firm.

## Highway Trailer shows improved rigs at conference

Advanced engineering developments and design features for public utility equipment manufactured by Highway Trailer Co., Edgerton, Wis., were demonstrated at a two-day distributors' sales conference.

Conducted tours were held at the plants in Edgerton and Stoughton, and field demonstrations of earth boring machines were held. Utility truck bodies, pole and cable reel trailers, winches and related equipment were shown. Advanced features for truck-mounted winches were exhibited. Digging tests were made under actual job conditions by the company's hydraulic derrick and digger, swing-base boring machine and Highway earth boring machines having a new type clutch and brake assembly.

## Peterson makes revisions in sales organization

Peterson Tractor & Equipment Co., of San Leandro, Calif., the northern California dealer for Caterpillar and John Deere tractors, has, in expanding and specializing the activities of its sales organization, made a number of departmental changes.

R. P. Nichols, former sales manager of the C & D Division, Yuba Mfg. Co., Bencia, Calif., has been named heavy industrial sales manager. The new sales promotion manager is former industrial sales manager Tom Hopkins. K. F. Park, consultant earthwork engineer and former advertising supervisor, will now devote full time to consulting work and engineering studies on earthmoving projects. Howard Chamberlain, former assistant advertising manager, is now assistant sales promotion manager for the organization.

## Kansas Engine & Equipment to handle Michigan line

Kansas Engine & Equipment Co., Inc., Wichita, Kans., has been appointed to sell and service Michigan tractor shovels and excavator cranes, products of the Construction Machinery Division of Clark Equipment Co., Benton Harbor, Mich. The new distributor will handle all of the counties in western Kansas.

## Toro names distributors

The Toro Mfg. Co., of Minneapolis, Minn., producer of power mowers, has appointed two new distributors. Howard Goldthwaite, of the Toro & Turf Supply Co., Atlanta, Ga., will be the Georgia distributor, and Gustine Sales & Service Co., Shreveport, La., the distributor for northern Louisiana and Bowie County, Texas.

## P&H three-state dealer

A new P&H diesel distributor for Delaware, and some counties in Pennsylvania and New Jersey has been announced by the Harnischfeger Corp.'s Diesel Engine Division in Crystal Lake, Ill. The new P&H distributor, the Rental Service Company, is a division of Service Supply Corporation of Philadelphia. Jack Davies is President and Sales manager.

The Rental Supply Co., located at 4605 N. Fourth St., will sell P&H industrial diesel power units and automotive diesel engines.

## New Timken distributor

Vanadium-Alloys Steel Canada Limited has been appointed the new distributor of Graph-Mo tool steels and Graph-Mo Hollow Bar, holding sole sales rights in the Dominion of Canada, Timken Roller Bearing Co. announces. Headquarters for the firm, which is a subsidiary of the Vanadium-Alloys Steel Co. of Latrobe, Pennsylvania, are in London, Ontario.

## Eastern Equipment expands activities

Eastern Equipment Sales, Inc., Springfield, Mass., and West Haven, Conn., is the new distributor of Lima shovels, cranes, draglines and pull shovels, manufactured by the Construction Equipment Division of Baldwin-Lima-Hamilton Corp., Lima, Ohio. They also distribute Austin-Western crushing equipment.

Eastern will cover the state of Connecticut and some counties in Massachusetts.

*Dealers—we will be glad to have news of your organization for publication.*


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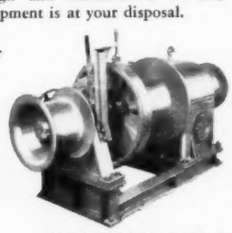
Model EP Drum Type Carpuller



30 H.P. Electric Mooring Winch

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**Always ready** to supply instant power for lights, operating tools, equipment, etc.

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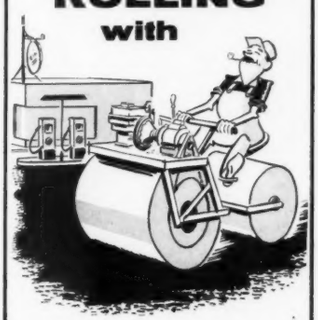
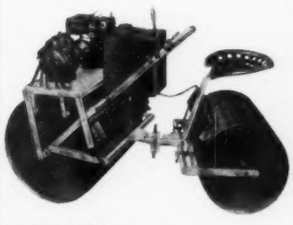


MIDLAND POWER ROLLERS

The Midland ½ ton Tandem Model is designed to provide economy, speed and efficiency on smaller asphalt paving jobs and all phases of landscape rolling operations.

Because of its size and extreme maneuverability, costly, inefficient hand tamping of confined areas is all but eliminated. This roller can follow right behind the rakers. There is no waiting period required for the asphalt to set. The compaction provided is adequate to compress the asphalt without squeezing towards the edges. The forward-reverse transmission provides an equal speed in both directions. Coupled dead center of both axles, the guide and compaction roller track one another perfectly, eliminating lap marks.

*See you at the A. E. D. Show*



*Write today for detailed information*

MIDLAND PRODUCTS CO.

MIDLAND PARK, NEW JERSEY, U.S.A.

For more facts, circle No. 662

**Weather charts**

# The weather outlook for February

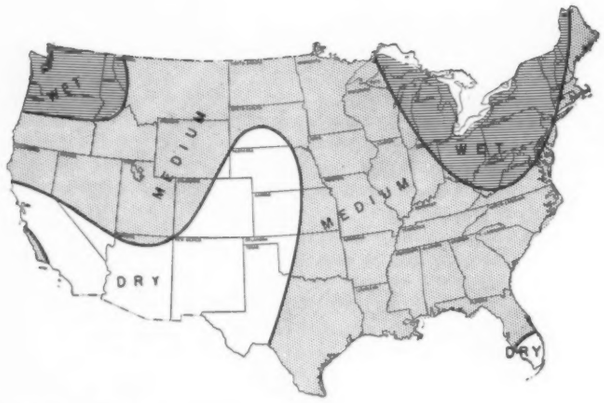



Chart I—Precipitation

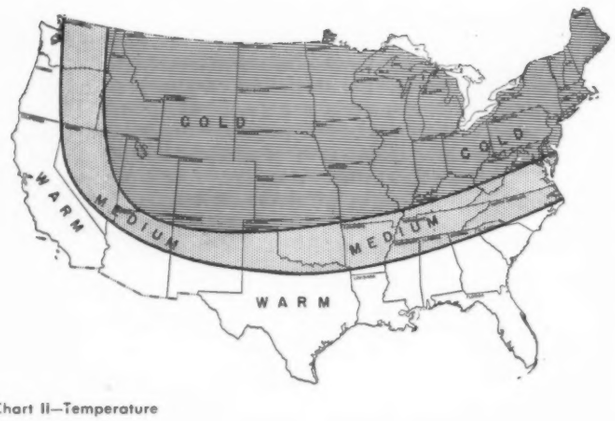



Chart II—Temperature

The accompanying weather maps indicate the average weather conditions to be expected throughout the United States during the month of February. Chart I classifies precipitation, and Chart II classifies temperatures.

Dry areas, indicated on Chart I, will average less than 6 days of precipitation. Medium areas will average between 6 and 12 days of precipitation, and areas marked wet can expect more than 12 days with precipitation.

In Chart II, sections marked warm will average less than 8 days with sub-freezing temperatures. Medium areas will have between 8 and 16 days with minimum temperatures falling below freezing; and cold areas will average more than 16 days with temperatures falling below freezing.

From the charts, a contractor would recognize that on the average he could anticipate less precipitation in Indiana than in Ohio, or more precipitation in northern South Dakota than in southern South Dakota. He could also determine that there would be a lesser number of days with below freezing temperatures in southeast Missouri than in southwest Missouri, or a lesser number in southeastern North Carolina than in northwestern South Carolina.

Prepared for CONTRACTORS AND ENGINEERS by the Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., the charts indicate average conditions and are not intended as specific forecasts. However, Weather Corp. of America will answer readers' questions regarding the applied uses of meteorology or climatology to the construction industry. THE END

"Weather Engineering for Profit", a new brochure published by the Weather Corp. of America, tells how to use weather sciences most profitably in the construction industry and other allied fields. For a free copy, write to CONTRACTORS AND ENGINEERS, 470 Fourth Ave., New York 16, N. Y., or circle No. 300 on the Request Card at page 18.


**WHEN YOU NEED...**

- **THE BEST IN CORES**
- **THE BEST IN DIAMOND BITS**
- **THE BEST IN DRILL MACHINES**

**CALL: SPRAGUE & HENWOOD, Inc.**

● Because SPRAGUE & HENWOOD has been a contract driller for years, they have tested and improved, and put into operational work many innovations which have become standard in the field. Because of these improvements, Sprague & Henwood's contract drilling department gets started faster, and submits to customers the best in cores, faster.

Beside contract drilling, Sprague & Henwood, in co-operation with the United States Bureau of Mines, has developed "oriented" diamond coring bits. Bits that really save you money—save it by giving you better performance at a minimum of diamond loss.

Write today for information on your own drilling requirements. If you want to do the drilling yourself, we have just the machine equipment and bits you'll need. If you don't want to do it yourself—we'll drill for you.

**SPRAGUE & HENWOOD, Inc.** S&H
SCRANTON 2, PA.

BRANCH OFFICES: NEW YORK • PHILADELPHIA • PITTSBURGH • ATLANTA
GRAND JUNCTION, COLORADO • BUCHANS, NEWFOUNDLAND

For more facts, use Reader-Reply Card opposite page 18 and circle No. 663

***IT's NEW --- The Campbell Sliding Cab***

*for the models HU, HH, and HO*

***"Payloaders"!!!***

This sturdy, modern design offers features long desired by "PAYLOADER" operators, among them—Sliding top, ball bearing mounted on steel channel—Rubber seals to insure weather tightness—Permanently mounted access ladder —Rear view mirror—Tinted safety glass windshield and skylight.

*Investigate* this completely new design in "Payloader" Cabs by calling your "Payloader" distributor, or contact

**CAMPBELL DETACHABLE CAB CO.**
**WAUCONDA, ILLINOIS**

For more facts, use Reader-Reply Card opposite page 18 and circle No. 664

**EARTH BORING MACHINES...our business**

*We manufacture Sterling Hydraulic Control Earth Boring Machines in sizes and models to fit your job and budget.*

Sterling Model "A" for heavy duty work
Sterling Enterpriser, 6 cylinder model
Sterling Enterpriser, 4 cylinder model
Sterling Prospector, built for REA and telephone work

**FROM EVERY ANGLE...**
**STERLING DOES YOUR JOB BEST**

*Complete parts are available for Sterling, Jaques and other make earth boring machines. We completely rebuild and repair all makes diggers in our well equipped shops.*

SALES SERVICE ANY WHERE IN THE NATION

**WYOMING VALLEY EQUIPMENT DIV.**
714 WYOMING AVENUE KINGSTON, PA.

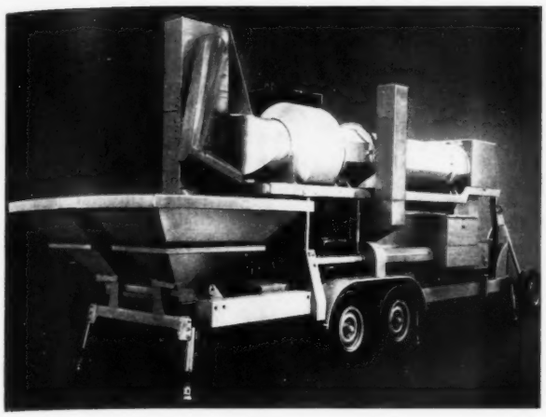
For more facts, use Reader-Reply Card opposite page 18 and circle No. 665

**WINSLOW—PORTABLE TRUCK SCALE**
**"THE CONTRACTORS' SPECIAL SCALE"**

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Cap.: 15-18-20-30, 50 tons.
Write us for name of your nearest distributor

**WINSLOW SCALE COMPANY** P. O. Box 1198 Terre Haute, Indiana

For more facts, use Reader-Reply Card opposite page 18 and circle No. 666



## Mobile asphalt plant completely automatic

■ A completely automatic mobile asphalt plant that can deliver hot asphalt mix at the rate of 15 to 20 tons per hour is announced by Wylie Mfg. Co., Inc. The Model 1520 Roadmaster plant has six adjustable screw-type stabilizers for stationary operation and can be towed from job to job by a dump truck or similar rig.

Twin aggregate hoppers hold more than one cubic yard of material each. A reciprocating plate feeder accurately apportions coarse and fine aggregates to the elevator boot. After the aggregate passes through the rotary dryer, it enters the weight-controlled aggregate batcher, from which it is discharged into the twin-shaft pugmill simultaneously with the proper proportion of hot asphalt.

Four low-pressure oil burners supply heat for the rotary dryer and the 400-gallon asphalt plant. A cyclone-type dust collector returns a part of the dust to the pugmill. All thermometers, gages, and control levers are centrally located at the one-man operator position. The plant is available with gasoline or diesel engine, mounted on six-pneumatic tires or on skids.

For further information write to Wylie Mfg. Co., Inc., P. O. Box 7086, Oklahoma City, Okla., or use the Request Card that is bound in at page 18. Circle No. 217.

*Visit Wylie Mfg. Co., Inc., at the Condex Show in the Conrad Hilton Hotel, Booths 149 and 150.*

## PCA elects chairman of board of directors

George E. Warren, president of the Southwestern Portland Cement Co., Los Angeles, Calif., was elected chairman of the board of directors of the Portland Cement Association at its annual meeting in Chicago. He succeeds Emory M. Ford, who had served as board chairman for two years. Warren has served on the board of directors since 1953, and has been a member of the executive committee for the past year.

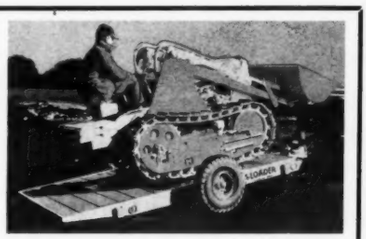

**NEW E-Z LOADER TRAILER**

2½ to 10 tons

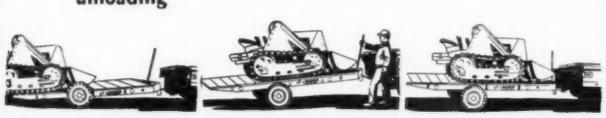
Fast - Safe - Low Cost "Elevator Operation"

No Planks - No Cranes

One man handles loading, hauling, unloading



E-Z Loader operates just like an elevator. Lower the bed to load machinery . . . raise the bed for hauling . . . lower the bed to unload — all by exclusive hydraulic system with either manual or electrical control. All-welded steel body for lasting, trouble-free service. Torsion bar suspension axle for stability under varying load and speed conditions. Tandem axles on 5 and 10-ton models.



Bed lowers flush to ground for easy loading. Hydraulic system raises bed to level-ride position. Long or short haul, one man handles it all.

Write today for more details on E-Z LOADER.

Dealer Franchises Available In Certain Areas

**E-Z LOADER, INC.** 2037 W. 14th St. Cleveland 13, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 667

"Keystone State" at work on St. Lawrence Seaway

**Transport Men, Materials with Speed and Safety**

- 40-ft. long, 12-ft. beam
- Welded steel construction
- Diesel powered
- Carries up to 35 men
- Portable — moves over land on tractor-trailer
- Low maintenance

For bridge, drilling, dam, pipeline, crib, dredging, or any other off-shore work. Contractors have found the HANSEN SEA-TRUCK a "Pick-up truck on water". It transports men and materials to and from the job . . . even does light towing!

Built by one of the oldest and best known companies: Standard model is complete with lavatory, toilet, horn, life jackets, running lights, etc. Many optional features available or special model can be designed to meet your needs. No licensed crew necessary.

Write or wire for basic specifications . . . or let us submit drawings to your requirements.

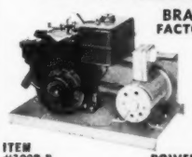
**HANS HANSEN WELDING CO.** 2824 Summit Street Toledo 4, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 668



SELECTED **TOP VALUE SPECIALS!**

SURPLUS ITEMS AT FRACTION OF ORIGINAL GOV'T. COST AT GROBAN'S



BRAND NEW 1957! FACTORY-TO-YOU-VALUE

**PORTABLE ELECTRIC LIGHT PLANTS**

ITEM #1008-B
Dimensions: Length 20½" Width 12" Height 16"

POWER TO OPERATE
● Water pump, Radio, Lights, Air-conditioner ● Refrigerator, Deep Freezer, Incubator ● Electric Saw, Electric Drills, Pipe Bender

Compact—Fits in the Trunk of Your Car

FULL 1000 WATTS continuous duty. 115 Volts, A.C. 60 cycles, 9 amps. Powered by husky Briggs-Stratton engine with recoil starter. Engine and generator operate at 3600 R.P.M. for maximum efficiency at minimum weight. Both units are mounted on steel base, with heavy sheet metal belt guard. Generator is self-regulating, and is equipped with outlet box containing fuse and 2 A. C. convenience receptacles. Cost only 5¢ an hour to operate. Shipping wt. 100 lbs. (Regular price $225.) You save $65.50. Now only, F.O.B. Chicago ..... **159.50**

ITEM #2008—2000 WATTS 115 V. A.C. generator set, powered by husky, fast starting Briggs-Stratton engine. Mounted on portable steel carrying base for easy handling.—Just right for small cottage and cabins needing inexpensive 2000 Watts of electricity. Ship. Wt. 190 lbs. F.O.B. Chicago **295.00**

**3 K.W. GENERATOR SET**

110 VOLT

PERFECT — • FOR POWER TOOLS • FOR LIGHTING • FOR ALL A.C. • D.C. SERIES WOUND MOTORS

ITEM #300

Rated 3 K.W. - 110 V. direct current, 28.5 amps at 2800 RPM. This husky contractors unit is powered by a dependable Briggs-Stratton 6 h.p. Gasoline Engine Complete with rheostat and voltmeter.

Only a fortunate purchase from surplus stocks permits this unusual value. Shipping weight 275 lbs. F.O.B. Chicago ..... **219.00**

G.E. SEALED BEAM

300 WATTS 110 VOLTS

**SPOTLIGHTS**

THROWS A BEAM TO 1000 FT.

ITEM #418

General Electric "Mazda", 5¼" sealed beam. Uses conventional 110-volt current A.C., D.C. — Fine for lighting up driveways, signs, parking lots, displays, garages. Built for use as Flashing Signal for U.S. Navy—to stand heavy surge loads. Shipping Wt. 2 lbs. U.S. Gov't. Cost $12.68 ea. Now Each **2.50** Postpaid

**Lots of 3 — 6.00, Ppd.**

**A. C. GENERATORS**

Ideal for powering electric tools, oil burner, refrigerator, lights, or other appliances requiring up to 1000 watts of power. 1000 WATTS, 115 Volts, 60 cycles A.C. 3600 R.P.M. Compact, self-regulating generator with V Belt pulley and double outlet receptacle. Rotation counterclockwise. May be driven by tractor or auxiliary gasoline engine. Requires 2½ HP minimum.

ITEM #1010 Dimensions: 10" long x 8" high x 6" wide. Shipping wt. 27 lbs. F.O.B. Chicago ..... **79.50**

Model 700—750 Watts A.C. ..... **59.50**

Model 2000—2000 Watts A.C. Generator **133.00**

¼" METAL **STAMPING SET**

STAMP YOUR NAME ON WOOD OR METAL!

ITEM #390

Full alphabet A to Z, "&" and period. Precision hand trimmed deep cut, hardened STEEL STAMPS—In fitted Wooden Box—made to rigid U.S. Navy specifications by Young Bros.—Comparable to sets selling for $27.00. Shipping Wt. 5 lbs. F.O.B. Chicago ..... **5.95**

MASTER & SLAVE **HYDRAULIC REMOTE CONTROL SET**

ITEM #415—Designed for remote operation of controls on engines, boats, special machinery, etc. Eliminates complicated mechanical linkages, cables, pulleys, etc. The master unit connects to the slave unit with a single ¼" tube. When master control lever is moved, slave lever follows exactly. Light, compact, aluminum alloy construction.

Dim. of both units: 5½" W, 9" H, 1¾" D, (exclusive of handle) Ship. Wt. 8 lbs.

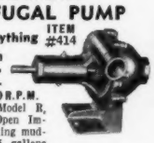
F.O.B. Chicago .. **27.50** per pair

*(Note — Tubing not supplied)*

*HIGGINS-BRONZE*

**CENTRIFUGAL PUMP**

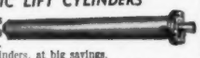
Pumps Almost Anything ITEM #414



Fine for: • Irrigation • Sump Pumping • Sewer Drainage 75 gallons per minute @ 2400 R.P.M.

Higgins Type PNB, Model R, marine bilge pump. Open Impeller design for handling muddy water. Delivers 75 gallons per minute, 30 foot head with ¾ H.P. motor. Pump body and impeller are made of solid bronze, with alloy steel ½" diameter shaft. 1¾" long. Rotation of the pump is clockwise. Inlet has 1½" pipe thread. Plain 1½" outlet for hose connection. Dimensions 12" x 7" x 8". Shipping weight 23 lbs. F.O.B. Chicago ..... **23.50**

*HYDRAULIC LIFT CYLINDERS*



• For Fork Lift Trucks • For Presses • Loading Ramps • Lifts 12500 lbs.

Heavy duty hydraulic cylinders, at big savings.

ITEM #502 — 4" Bore — 36" Stroke — 1¾" Piston Rd. Wt. 95 lbs. F.O.B. Chicago .. **72.00**

ITEM #503—4" Bore—54" Stroke — 1¾" Piston Rod. Wt. 135 lbs. F.O.B. Chicago .. **96.00**

*BRAND NEW HEAVY DUTY TWO UNIT*

**VICKERS HYDRAULIC PUMP**

• For Hydraulic Presses • For Lift Trucks • For Tractors • For Road Machinery ITEM #417

The Vickers model V-2129-FLH is actually two hydraulic pumps on a common shaft.

The large hydraulic pump is rated at 21 G.P.M., 1000 lbs. P.S.I. at 1200 R.P.M., for conventional hydraulic system and the small pump is rated at 3 G.P.M. and 1000 lbs. P.S.I. for power steering or for a second hydraulic system. Rotation counterclockwise.

Use them individually or collectively.

Dimensions: 13⅝" Long x 9" in diameter with 1" shaft. 1⅛" inlet port and 1¼" outlet port on large pump. 1" inlet port and ¾" outlet port on the small pump. Shipping Wt. 66 lbs. Worth $212.50. Now priced below the value of the smallest pump! F.O.B. Chicago ..... **69.50**

**16-TON "SIMPLEX" SCREW JACKS**

BRAND NEW

ITEM #505 • For house movers, railroads • Construction Equipment • Machinery, rigging.

16-Ton Simplex screw jacks, 1¾" x 16", 4-way head type, with malleable iron base, and heat-treated steel handle. Shipping Wt. 35 lbs. F.O.B. Chicago. EA. .... **9.50**

**Set of 4 - 35.00**

F.O.B. Chicago

FOR PHONE ORDERS CALL WEbster 9-3793

ORDER DIRECT FROM AD SATISFACTION GUARANTEED Send Payment Or Purchase Order Today

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FREE!—New Catalog 1957 EDITION, 60 Pages, chuck-full of unsurpassed War Surplus Equipment Bargains for farm, home, factory, workshop. Write

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## Surveying washington

by HUBERT KELLEY, Jr.

**Still less than 30 weeks old**, the new federal highway program is already showing signs of costing more and taking longer to complete than anyone had anticipated. During the third quarter of 1956, the price level for federal-aid highway construction shot up 3.8 per cent, with the greatest increase in the cost of structural reinforcement, surfacing, and concrete structures.

In dollars, the price jump in the same quarter means that the road program will cost one billion dollars more than planned, and, since the taxes to pay for roads are a part of the highway act, federal authorities admit that the program may stretch past the 15-year point.

The law, of course, freezes current prices into contracts now being signed and permits no changes because of rising or falling costs.

**The Hell's Canyon dam controversy** is far from dead, but it is likely to take a new form this year. Last year, the Idaho Power Co. was granted a permit by the Federal Power Commission to build three low dams at the Oxbow, Brownlee, and Little Hell's Canyon sites. The Truman Administration and public power advocates led by Sen. Wayne Morse (D.-Oreg.) favored one high federal dam at Hell's Canyon, but Sen. Morse lost his fight to get Congress to nullify the Idaho Power permits.

The latest word is that Secretary of the Interior Fred Seaton wants a high federal dam built at the Mountain Sheep-Pleasant Valley site on the Snake River, a proposal which would eliminate Idaho Power's third dam at Little Hell's Canyon. If Congress approves his plan, the high dam would also eliminate a proposal by the Northwest Pacific Power Co. to build two low dams at Mountain Sheep and Pleasant Valley.

Secretary Seaton is reportedly opposed to this private utility combine getting a grip on such an important part of the Snake-Columbia River system, but there are undoubtedly some knotty political considerations behind the plans for a new federal dam. Former Secretary Douglas McKay made power policies a key issue in his Senate fight with Wayne Morse, and he lost by a substantial majority. Election returns from other northwestern states also indicated heavy voter distrust of GOP policies on natural resources. It would be strange indeed if Secretary Seaton failed to reappraise those policies.

In a post-election address, however, the Secretary affirmed his faith in the Administration's "partnership" concept of power development, declaring that "so long as I am Secretary of the Interior Department, it will never attempt to impose a basin-wide or valley-wide authority on any section of the country."

But he pointed out that FPC issues licenses for private power projects only for 50 years, and added that the government can take a new look at the project at the end of that time. "If a better or more important use is found for the water, the license need not be renewed," he concluded.

Total 1957 outlays for new construction have been estimated at $46.5 billion—$2.5 billion more than in 1956—by the Commerce and Labor Departments. The biggest increases will be in nonresidential building, highway construction, conservation and development, and sewage disposal.

Construction costs generally are expected to rise at a lower rate than they did last year, the departments said, and building materials should be in adequate supply, with no more than minor spot shortages.

**School construction tops the list** of major issues to be decided by the 85th Congress. On this point, both leaders agree.

On the GOP side, Secretary of Welfare Marion Folsom has announced that President Eisenhower meant every word of his campaign pledge to build needed schools in just four years instead of five, and the President's aides say he will push hard to make his pledge come true.

Calling a federal-aid school program "critically important", Secretary Folsom added optimistically, "I don't see any reason why we can't get a school bill through Congress this next session." He also promised Administration support to a measure to increase teaching facilities in the nation's medical schools.

Among Democrats, Senate Major-

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ity Leader Lyndon Johnson, (D.-Texas) has admitted congressional failure to solve the school dilemma and promised another try this year. Democratic staffs are already preparing their own version of a school bill as a ready reply to Administration demands.

During the presidential campaign of course, each party blamed the other for defeat of the school bill, and both parties backed up their claims with statistics. In one speech, President Eisenhower charged that Adlai Stevenson had supported "the principles of the bill that we proposed and that his party defeated." On the other hand, Stevenson claimed that the Administration "has utterly failed to develop a comprehensive national policy for education."

The final vote in the House last year on passage of the bill was 119 Democrats and 75 Republicans for; 105 Democrats and 119 Republicans against. The voting pattern followed anything but party lines, and it is difficult to see how either party can take credit or cast blame.

The vote makes this much clear about 1957: Northern liberals in both parties will have to come up with a bill that is acceptable either to Southern Democrats or conservative Republicans—or both—before there is any chance of passage. Such a course will require a far more flexible spirit of compromise than prevailed in Congress last year. It will also mean that the bill will be entirely acceptable to almost no one.

In spite of the formidable obstacles to passage of a school bill, most veteran Capitol observers believe now that some sort of federal-aid legislation will be approved. Few think a bill will pass by any resounding majority, but they predict that enough concessions will be made to enough groups to pick up the votes necessary for passage.

**The flow of mortgage money** for new housing will be another big issue before Congress this year. Recently, the Administration predicted that the value of residential nonfarm construction will drop to $14.7 billion in 1957 from $15.2 billion in 1956. Since the home building rate dropped last year as well, the prediction caused real concern among builders and government officials.

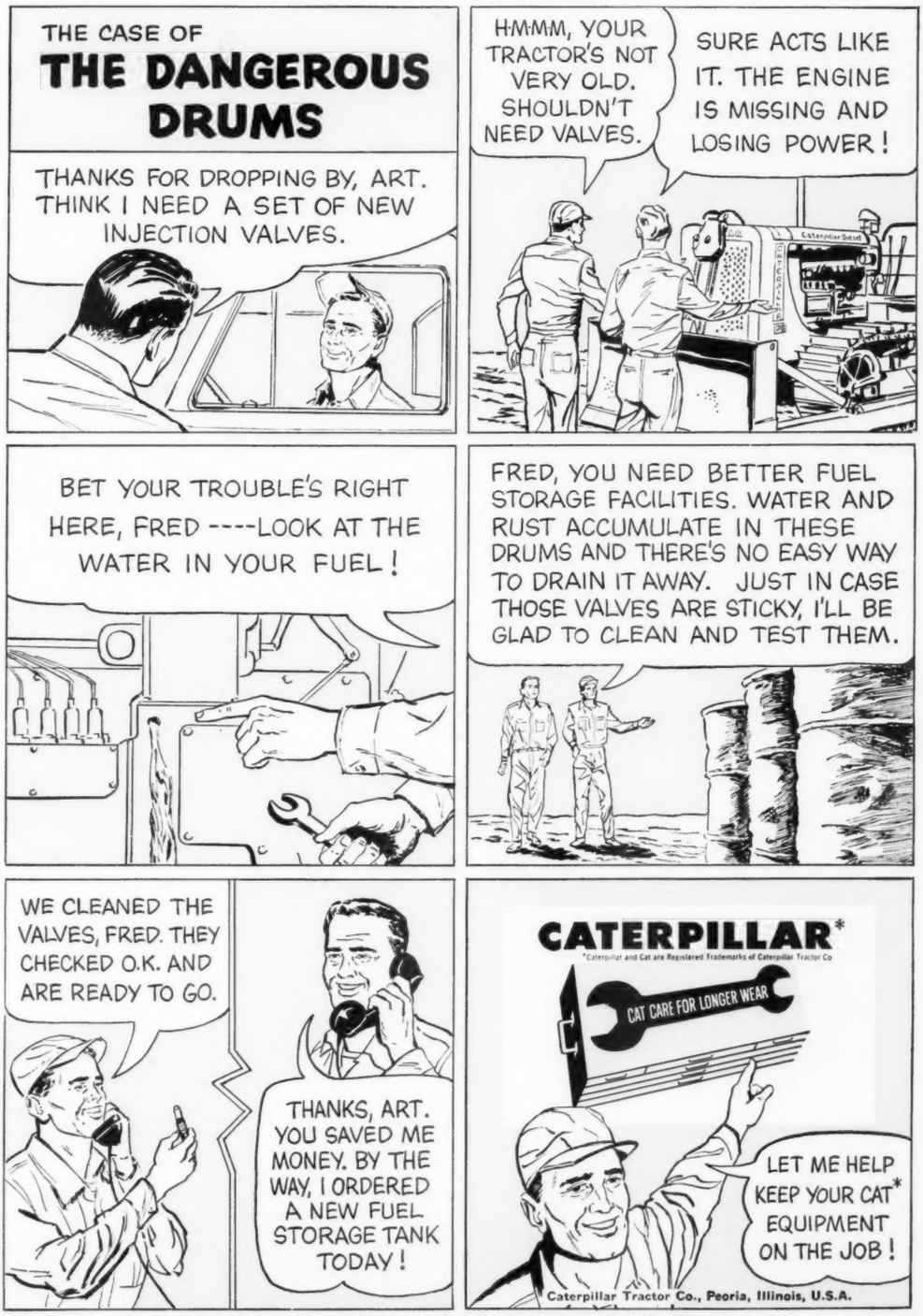
Most of the blame for the fall-off in housing starts has been heaped on the Federal Reserve Board. Commenting on the board's "tight money" policies, Housing Administrator Albert M. Cole said recently that "no major segment of our economy has been more adversely affected by the competition for investment capital than home building and allied industries."

Sen John Sparkman (D.-Ala.) agreed. He noted that "the mortgage market is unusually sensitive to the imposition of general credit restrictions," and added that the Board's attempt to make credit restrictions equitable have had "a disproportionately severe effect on the housing industry."

Sen. Sparkman has promised that his Senate Housing subcommittee will hold public hearings this year "aimed at relieving the present shortage of mortgage money," for he is dubious about the value of stopgap relief measures taken by the Administration. When the hearings are held, Cole says he expects to be prepared with specific proposals to place housing in a stronger position in money market.

Cole's views, however, do not have the blessing of all Administration leaders. Treasury Under Secretary Randolph Burgess, for one, has said that "tight money" has been a partial brake on rising building costs. If costs had been permitted to keep on rising, he noted, they would have seriously threatened to narrow the market for houses. There's a good chance that Administration witnesses will come into open conflict over the mortgage money problem when the

[illegible] Labor Department [illegible] the median selling price [illegible] new houses rose to $14,500 in 1956. This is a 6 per cent increase over 1955. It added, however, that the average floor area of homes increased in about the same proportion to 1,230 square feet. No inflationary trends, in other words, were apparent last year in home-building, and a good many real estate editors point out that home buyers are getting much more for their money than ever before, when "extras" are considered.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